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The Strength of Building Materials.

HOWEVER often a good treatise on this subject may be presented to our notice, we welcome it. To have buildings strong enough without waste of materials is a very important thing. Dr. S. Downing, Professor of Civil Engineering in the University of Dublin, has brought together, in his "Practical Construction,"* Part I., a large amount of useful information to architects and engineers, from some of the best sources, on the resistance of cast iron, wrought or malleable iron, and timber, to *direct compression* and *tension*. The properties of some other bodies, viewed in connexion with their existing powers more or less essential in the art of construction, such as stone, brick, &c., are also given in this work.

The force which is sufficient to overcome the cohesion of the material is the measure of its ultimate strength, and, stated in general terms, this is proportional to the sectional area of the piece tried. The method which the author has adopted is to state in each case a proposition, and to prove it by adducing a number of the best experiments. Thus, in the case of a rod or bar of malleable iron of the highest quality, the ultimate strength is 25 tons per square inch; of plates, such as boiler-plates, 20 tons; and of drawn iron wire under one-tenth of a square inch in section 36 tons per square inch. These are proved by the experiments of Mr. Telford, Captain S. Brown, Mr. Fairbairn, Mr. Edwin Clark, and Mr. Eaton Hodgkinson. Although cast iron is not in practice applied to resist a direct pull, yet its power of resistance to a tensile force is important to be known, in determining the form which beams should have. The ultimate resistance of cast iron to a tensile force is about 7 tons, or 7½ tons, per square inch of section; while wrought or malleable iron is, on the average of the strengths of various kinds, about 20 tons. We cannot always in practice ensure materials being of the highest quality, and we may therefore reckon the tensile strength of wrought iron to be about three times as much as that of cast iron.

After proving each proposition by experiments, the author gives "practical applications and examples," and says, "In applying to the actual practice of construction the knowledge of the ultimate resisting powers of any material, as obtained by experiment, the engineer must, in all his designs, keep in view the great objects of permanency, stability, and safety, and therefore assign to every part such dimensions and form that it shall be acting far within its ultimate power. But the question at once arises,—How far within? What fraction of the ultimate must be the actual resisting force called forth, and this, not only in the case of tensile, but of all other forms of resistance occurring in structures. For this no absolute rule can be set down; a careful judgment and a sagacious use of existing precedents must alone guide us here: a knowledge not only of existing successful works,—which, from being, as may often occur, stronger than strong enough, have perhaps purchased their stability at the expense of economy, and are consequently, so far, not to be followed, but also from the records of past failures, which are in truth but unintended and expensive experiments. Thus, it would appear that there is yet a knowledge required, above and beyond that given by experiment, which it cannot teach, and that is the proper application to practice of the facts established by that means."

The author says of wrought iron that we learn from the largest existing works of a permanent character that no part in tension is strained so as to call forth a resistance greater than about 5 tons per square inch of the transverse section; that is, one-fourth of the ultimate resistance. "The main chains of the Menai Suspension Bridge are resisting 5·4 tons per square inch; the bottom of the Conway tubes 4·5 tons; and of the Britannia tubes 5·62 tons per square inch. The Boyne Viaduct was so designed that 5 tons per square inch was the maximum strain from the greatest load." Considering the importance of the point to be determined, it would have been better that other examples should have been given; for it is probably not in the largest works where we shall find the greatest strain per square inch of metal, and we commend this to the notice of the author in anticipation of a second edition; the more so because he acknowledges that it is only from such examples of actual construction that we can derive the safe strain to which the material may be subjected in practice. Besides the strength of the iron itself, in the form of bars and plates, that of bolts and rivets claims attention. As a rule, bolts should be so applied as to bear a direct tensile strain, and not a cross or shearing strain; but rivets are purposely applied to resist a shearing strain. Mr. E. Clark made a number of experiments at the Britannia Bridge, on the resistance of bar and rivet iron to this form of strain, from which he deduced two simple laws, viz., that the ultimate resistance of any bar to a shearing force is proportional to the sectional area of the bar thus severed; and that the ultimate resistance of any bar to a shearing force is nearly the same as the ultimate resistance of the same bar to a direct longitudinal tensile strain.

The author fully explains the various ways in which plates are riveted together, and the strength of riveted joints, also the joints of bar links of bridges; and the proportions of the heads and nuts of bolts to the diameter of the bolt, and of the depth and pitch of the screw threads, are given in detail.

The resistance of fir timber to a tensile strain in the direction of the fibres is stated to be about 5½ tons per square inch in carefully-selected specimens. It is important to know not only the cohesive force of timber in the direction of the fibres, but across them,—its lateral cohesion; for this is very much less than its strength in the other direction. It is in fir timber but 1-20th part of the cohesion in the direction of the fibres. The practice of carpenters to leave a considerable length between the foot of a principal rafter and the end of a tie-beam, and between the foot of a strut and the end of a king or queen post, is adduced to show that they are aware of this small lateral cohesion of the fibres of timber. In the folio plates of the details of construction of works in iron and timber, fourteen in number, examples of a king-post and a queen-post roof are given (plate 5). When a new edition of these may be required it will be well to correct the drawing of the iron straps at the feet of the principal rafters. They afford no correct information to a student of the form in which such straps are made. Indeed, these examples of roofs were better omitted altogether; the dimensions of the several scantlings are not well proportioned, some being too heavy and some too light, and the straps at the heads of the king and queen posts are useless, except in quite exceptional circumstances.

The ultimate strength of cast-iron to bear a compressive force is stated at 42 tons per square inch, if the height of the specimen is from 1 or 1½ diameter high to from 3 to 5 diameters high; between these limits the strength is proportional to the sectional area. For the lesser heights, below 1½ diameter high, the material gradually increases in strength, and at last, even if an unconnected granular mass, would resist without any limit or any law. Between the heights of 3 or 5, and 25 or 30 times the diameter, the column yields by bending before its ultimate crushing strength comes into force. A table is given from Mr. E. Hodgkinson's experiments, which shows the weights producing fracture of long pillars by flexure, as leading to a practical rule for the due proportioning of columns to the duty they have to perform in actual construction. Mr. Hodgkinson's own remark is, "I have many times sought, experimentally, with great care, for the weight producing incipient flexure, according to the theory of Euler, but have hitherto been unsuccessful. So far as I can see, flexure commences with weights far below those with which pillars are usually loaded in practice. It seems to be produced by weight much smaller than are sufficient to render it capable of being measured. I am, therefore, doubtful whether such a fixed point will ever be obtained, if, indeed, it exists." Further experiments by Mr. Hodgkinson are given, and from the whole the conclusion is arrived at that the strength of pillars of the same diameter, but of different lengths, is inversely as the 1·63 power of the length. Thus bars 1 in. diameter, and 10 ft., 6½ ft., and 5 ft. in

* Elements of Practical Construction, for the Use of Students in Engineering and Architecture. London: Longmans, Green, & Co. 1875.

length are of equal strength under the following weights. Comparing the bars 10 ft. and 5 ft. long, $\frac{1}{10^{1.63}} : \frac{1}{1^{1.63}}$, or $\frac{1}{42{\cdot}658} : \frac{1}{13{\cdot}7823}$, or 1 to 3 nearly.

If the lengths 10 ft. and 6½ ft. be compared, the weights are $\frac{1}{10^{1.63}} : \frac{1}{6{\cdot}5^{1.63}}$, or $\frac{1}{42{\cdot}658} : \frac{1}{21{\cdot}137}$, which is very nearly as 1 to 2. Thus at about two-thirds of the length the strength of the pillar is doubled, and at half the length it is nearly trebled.

Comparing the strength of pillars of the same length and of different diameters, they are found to vary as the 3·5 power of the diameter.

Pillars of the same length and diameter differ in strength according to the manner in which the ends are formed. A long pillar with flat ends, turned true, perpendicular to the axis, and well bedded, is about three times as strong as a pillar of the same length and diameter with the ends rounded. It is found also that when the pillar has one end flat and one round the strength is two-thirds of that of a pillar with both ends flat. The comparison between the strengths of pillars with round and with flat ends has reference to pillars whose length is not less than thirty times the diameter. In pillars shorter than this proportion the strength of those with round to that of those with flat ends is not in a constant ratio; and it is found that it decreases when the length compared with the diameter decreases.

The cause of the different strength of pillars, according to the form of the ends, may in part be referred to their different mode of fracture. The pillar with rounded ends breaks at or near the middle, and with one fracture. The pillar with both ends flat, and perpendicular to the axis, breaks generally at three places—in the middle and near each end. The pillar with one end flat and the other rounded, breaks with one fracture, but at a point distant from the rounded end one third of the length.

A pillar with both ends flat, and with the weight firmly and evenly bedded, and another with the ends rounded, may be compared with a horizontal beam fixed at both ends, as against another only supported at both ends.

Malleable or wrought iron is frequently employed to resist compressive forces, especially in bridges, where it is used for the primary reason of its suitability to resist tensile forces, and is put under compression in other parts of the same structure because it is difficult to unite pieces of wrought and of cast iron in the same structure, and its comparative weakness to resist a compressive force is compensated by increased dimensions: thus the top flange of a wrought-iron girder is made of greater sectional area than the bottom flange. The ultimate resistance of wrought-iron to a compressive force is from 16 tons to 18 tons per square inch, stated in general terms; but when applied in thin pieces, as in plates, the compressive force tends to buckle it. This was shown for the first time on a practical scale when it was necessary to determine in detail the dimensions of the tubular bridges intended to span the Conway river and the Menai Straits. "This crumpling up of wrought-iron plates is but a modification of the phenomena of failure by compression, and one that can only occur with a ductile and tenacious material, which does not separate into fragments, or suddenly break across, as cast-iron is observed to do."

The author gives the particulars of twenty-one of the forty experiments made by Mr. Eaton Hodgkinson, to determine the law of strength of wrought-iron plates, and finds that in respect of comparative lengths, breadths, and thicknesses, the strength is inversely as the square of the length, directly as the breadth, and directly as the cube of the thickness, so that doubling the breadth of a plate simply doubles its strength, and doubling the length reduces the strength four times; but doubling the thickness increases the strength eight times; and if the thickness be increased by only the fourth part, the strength to resist destruction by flexure is very nearly doubled; but these laws hold good only for pressures not exceeding 9 tons per square inch of section, above that crushing begins to take place, causing a deviation from these laws. "When failure takes place in any wrought-iron pillar, or the top of any ordinary tube, by actual crushing, it will be found to have sustained little more than about 16 or 18 tons per square inch of transverse section, and no alteration in its manner of construction would be of any avail; but should it fail by buckling, its breaking strain would fall short of this quantity; and any contrivance or method of construction which would give it rigidity, and prevent buckling, would bring the structure nearer to this limit of crushing."

Besides a large store of information on the subjects we have mentioned, the author treats of timber in compression, stone and brickwork in compression, the manufacture of Bessemer steel, and some properties of lead and copper. The folio plates which accompany the volume show some good examples of construction in the Erith ironworks and in the corn warehouses at Liverpool and Birkenhead.

AMONG THE ACADEMY PICTURES.*

No one who visited last year's Academy will have forgotten Mr. Fildes's remarkable picture, "The Casual Ward," or fail to look what the artist has to give this year; and, probably, few would guess that the brilliantly-painted single figure, under the title "Betty" (1,221), was by the same hand. It speaks much for the real originality and power of this rising artist, that he has made no effort to repeat his success of last year, but has chosen to give a test of his talent in dealing with the most opposite subject and style. "Betty" is a three-quarter length, life-size, of a damsel in the full blow of ruddy health, coming through the long grass, with milking-pail under one arm and stool hanging in the other hand. The vigorous action of the figure is admirably given, and all the accessories add to the light and fresh impression of the whole,—the landscape in the strong sunshine behind, the pail still wet inside, and containing a bunch of field daisies, the glint of the bright sun-light through the brim of the straw-hat, all combine to give intensity to this picture of rustic health and good humour. The work has been judiciously hung in an out-of-the-way place in Gallery X., where it cannot endanger the figures of certain Academicians. A like compliment has been paid to Mr. Eyre Crowe's best picture, "The French Savants in Egypt, 1798" (831), which is to be found near the floor, in a corner of the "Lecture-room." When the Mameluke cavalry charged the French, the cry was,—"Messieurs the savants and the donkeys within the square!" and here we have them, a group of portrait-figures, their parti-coloured dresses forming a bright contrast under the hot sun; one or two prudently reclining on the ground while the firing goes on outside; Balzac (not the novelist) in green coat, squatted down in a somewhat toad-fashion, and reckoning on his fingers the points of an argument he is full of; among the group seated on their donkeys is seen the beautiful feminine profile of Berthollet, who listens with philosophic calm to some eager remarks of Geoffroi St. Hilaire. This is a work full of humour, interest, and executive ability, better than the artist's other two pictures, of which "Sheep-shearing" (202) was hardly worth the trouble evidently bestowed on it, though it is exceedingly clever in its way. The Lecture-room contains also the sole work by Israels, "Waiting for the Herring-boats" (850), not quite a fortunate specimen of the artist; his "broad" treatment of the sea is here exaggerated into roughness, and the figures have hardly the usual interest of his works.

Mr. Calderon's two principal works this year both take us to the neighbourhood of Arles; in one we have the cloisters of St. Trophyme, where a "refurbishing" (210) of the church "properties" is going on, and a very plain old priest stares in open-mouthed admiration at the renewed lustre with which the silver image of his saintship shines out, after a scrubbing from the pretty black-haired damsel, in red scarf, who holds it up. In the other work the same pretty woman, chin in air, forms the centre of a trio of "coquettes" (250), who come over a bridge laughing at the discomfiture of the swain behind who has been snubbed, but is trying to carry it off by a contemptuous manner: the humour of this latter figure is admirable. Both works show that strong and uncompromising light affected by the artist, in which every detail of figure and costume comes out with a clearness perhaps bordering on hardness, and in which, at all events, no difficulty can be evaded or slurred over. But Mr. Calderon scarcely, of late years, keeps up to his former standard in elevation of feeling and subject; "*Toujours fidèle*" (319) has a quiet pathos, but has been much surpassed by former works of a similar tone of feeling. The little bit called "Great Sport," where two children wade waist-deep through bright sunlit grass after butterflies (1,158), is most perfect in its way; but the subject, of course, is slight.

Some author (is it Dickens?) has recorded an argument to the effect that post-boys are immortal, because "no one ever saw a dead post-boy, or the grave of one." Mr. Marks thinks they are worth immortalising, at any rate, for he has expended his best powers on the delineation of "Three jolly Post-boys" (166) in a state of beery exaltation round a table outside a tavern door, two of them listening in high enjoyment to the facetious remarks addressed by the third to the comely Hebe of the house. The artist has seldom done a cleverer thing than this; the face of the "boy" opposite, who cannot restrain his laughter, is a perfect study of grotesque facial expression; the whole of the accessories are painted with the greatest care, and certain sunflowers are introduced with marked effect as a foil to the blue jackets of the trio. The humour of the "Merrie Jeste" (242) is much more worthy of the artist's talents, and recalls the peculiar bouquet of "a chapter of Rabelais" last year,—a new turn in Mr. Marks's humour. The man telling the jest is a type frequently met with; somewhat solemn and heavy in his way of telling it, in spite of his twinkling eyes; the suppressed enjoyment in the screwed-up features of the other is quite infectious. The picture hardly needed so much back-ground. From Mr. Marks's humorous men to Mr. Leslie's lovely women is an effective contrast. We have alluded to the "School Revisited" (196) of the latter artist. A beautiful young lady just married has come back to the school, which she but lately left, and sits on a bench in the court-yard among some of her old companions, one of whom greets her through a window, another silently contemplates her with a reflection on her own possible future, and two young girls study the wedding-ring on the visitor's hand with an expression of interest and awe. The tones of the dresses make a quiet harmony delightful to the eye; the principal figure has an exquisite grace and sweetness, but she certainly belongs to a social sphere quite above her companions, who are rather unfairly treated as a foil to her. "On the Banks of the Thames, A.D. 200" (1,193), is simply "Nausicaa" over again, with another name; and on "The Path by the River" (438), sits the same young lady who a year or two ago eloped in "A.D. 1745," looking rather repentant; the sunlight effect through the trees here is very pleasant.

We may class together Mr. F. Walker (as represented this year), Mr. Boughton, and Mr. Morris, as representatives of idyllic landscape, in which figures give the predominant interest of the scenes. Mr. Walker sends only one small work, "Right of Way" (25), which is disputed by a motherly sheep against a woman and a little boy, to the discomfiture of the latter. The figure of the woman has that rather exaggerated action of the legs which the painter is apt to fall into; the landscape, with its rainy sky and grass studded with daisies and sparkling with light, shows its authorship at once; and we cannot but observe how far superior are the sheep to the production of certain well-known manufacturers in this line, who have kept the Academy in sheep any time these twenty years. Mr. Boughton's principal work this year, "The Bearers of the Burden" (101), is an advance upon previous works in tone of feeling and motive; the bearers of the burden are the women, three of whom trudge along a little way in the rear of a lord of creation, in the shape of a navvy with his coat thrown over his back and the sleeves hanging down behind, *more suo*; his face is not seen, but doggedness and obstinacy are in every line of his figure, and he can be no very pleasant head of a household. The landscape through which the figures move seems in keeping with the feeling of the subject,—grey and melancholy. Of the artist's two single-figure pictures, "The Path of Roses" and "Gray Days" (182, 198), the latter is the more successful. Mr. Morris, in "The Widow's Harvest" (37), repeats somewhat the feeling and manner of a former work, with less effect; but in "The Mowers" (1,192), he shows symptoms of departing from the groove he seemed to have fallen into; the men here, in the full swing of work, are well contrasted in character, and show much life and spirit in design. But of those who combine nature with figure

* See pp. 381 and 407, *ante*.

subjects, Mr. Hook is for the present pre-eminent, and has never been better than this year. His finest work, and one in a style rather different from what we are used to, is "The Land of Cuyp" (308). Here, in place of the slaty-blue sea of the South of England coast scenes, we have what Tennyson calls a "brimming river," full and slow, and probably a little muddy, but bright with the reflected light of the sky; in the foreground a youth pours milk into a brass vessel, while a girl who has been milking stands by, her head in a full light, and beautifully relieved against the sky without the slightest hardness or over-definition of outline. Another most original work is "Wise Saws" (256), croaked by a big raven on a rail in the foreground, for the benefit of some cows which are cooling themselves in the stream, and looking with ineffable stupidity at the eloquent bird; the contrast between the tone of the water, the general aërial tone of the picture in fact, in this work and in the last named, speak much for the painter's diligent study and appreciation of local character and tone in scenery. In his old manner are "Hearts of Oak" (47) and the "Samphire Gatherer" (439), of which the former is the best; in the latter, the painter has not realised so strongly the look of depth, from the height of foreground down to the water, as he has in one or two previous similar compositions. With this class of subject (though in a sufficiently different manner from Hook) we may place "The Votive Offering" (431) of Mr. Hennessey, who has succeeded in striking out a line of his own, and has kept to it, and improved it. The present picture shows a scene on the coast of Normandy (on high land overlooking the sea), where it is not unusual for a sailor to take a model of his ship as a votive offering, to be hung up in the church, and ensure the safety of the real vessel on her voyage. The worthy sailor walks slowly through the scattered trees supporting his mother on one arm, and carrying his mimic ship, followed by his wife and child; a priest, the *genius loci*, sits on a bench with his back to the spectator, and looks over the sea: there is a quiet diffused light over the whole which accords well with the feeling of the subject; though by no means powerful or striking, this is a very pleasing work, of some originality.*

Of Mr. Frith's numerous life-size figures the best probably are "Polly Peachum" (*Beggars' Opera*: 614), and "St. Valentine's Day" (320), an Irish lass showing her teeth in a broad grin of delight over a gay valentine. It appears to be a kind of necessity that the quota of works of this type should be annually furnished by the artist; it is a pity that a painter of such high ability should not aim at something of more intellectual interest than these works, with whatever technical merit, can be said to possess. Mr. E. M. Ward has been very successful in hitting off Lady Tenzle before her marriage, employed, as she describes herself, in strumming her father to sleep after a day's hunting and a heavy dinner (283); she looks very like the sort of girl, and is formal, weary, and impatient in her expression and mechanical manner of playing; and the old gentleman, red faced and somnolent, with his handkerchief over his head and the wine and walnuts at his side, is a capital study. Mrs. Ward's episode in the boyish days of the Ettrick Shepherd (380), is a picture that will find many admirers, both for its sentiment and its free style of manipulation. A kind of moral lesson seems to have been aimed at in hanging Mr. Prinsep's "Minuet" (125) and Mr. Stone's "Sain et Sauf" (130), so as to balance each other—the contrast of refined luxurious amusement with love and affection in humble life; the former is a very well painted collection of rather sleepy-looking figures in satin dresses, effective in colour; the latter is a work of considerable spirit and feeling; the scene is the interior of a French soldier's cottage, in whose absence on siege duty an increase in the family has taken place, and he and his good woman, who is still confined to bed, are giving vent to their feelings of mutual congratulation, on his safe return; she flings her arms round his neck with an expression none the less real and touching for being displayed on plain and homely features; the little daughter tries to excite her father's attention to the new comer in the cradle. The whole of the accessories are most carefully studied and painted, and there is a genuine though rough pathos in the scene which is very interesting, and shows the artist in rather a new light. We should not forget, speaking of Mr. Prinsep, his other large work, "Home from Gleaning" (392), four or five girls in a kind of procession with the bundles they have collected, in which a more serious tone is aimed at than in the "Minuet"; not quite successfully, though as a composition it is very good.

Mr. Hodgson's pictures this year are not so interesting in subject as some of his previous Eastern scenes; indeed, the two principal ones, "A Barber's Shop in Tunis" and "Cockfighting" (141, 241), are rather repelling, though there is excellent humour in the professional pride of the operator and the misery of the patient in the first-named. In brilliancy and purity of colour they are an advance upon previous works. Mr. Storey has given his chief effort to portraits this year, and his "Mrs. Finch" (24) is a very charming specimen of the *au naturel* order of portrait. The lady leans over a balustrade facing the spectator, her shoulders covered with a lace scarf. The features and the hand resting on the balustrade are beautifully modelled; the latter we note because there are some very bad hands in the exhibition by those who ought to be better hands at it. The rather hard texture and cold tone, which suit very well with Mr. Storey's Dutch or Queen Anne subjects, where all is artificial, strike one as not quite pleasant in this life-size portrait. His small work, "Caught" (142), is in his best way in humour and execution both. M. Tissot, who has constituted himself the painter of London drawing-rooms, is also at his best in "Hush!" (1,233), the ejaculation being preliminary to the commencement of a violin solo by a remarkably pretty young lady amateur, who stands, with bow outstretched, in a slightly theatrical attitude. Among the company two "distinguished Orientals" are conspicuous, and sit with their hands square on the arms of their chairs, desperately uncomfortable in their white kids, and staring at the player much as the cows in Mr. Hook's picture stare at the raven. We say the artist is at his best here, with the reservation that his best might be better; he is either too superficial or two cynical in his view of this phase of modern life. Even people "in society" have souls, if M. Tissot could find it out. Being in a humour for contrasts, we will jump from M. Tissot to Mr. Erskine Nicol, who has travelled south to see what "The New Vintage" (245) is like, and has brought a capital reminiscence of it in the figure of the fat, comfortable Spaniard (or Portuguese?), reflecting solemnly, with an eye fixed on futurity, on the quality of the half-glass he has just swallowed; the work is a good one in every respect, and we only wish it may herald a little further variation from the "dirty Irishman" type of subject, which the artist had fairly wearied us of. His larger work, "Always Tell the Truth" (561), is clever enough, no doubt; but that a painter should spend this trouble and take up this space in portraying two of the most disagreeable types of humanity extant,—a stupid, ugly old woman, and a fat, blubbering boy,—is enough to make one absolutely angry. A pleasanter picture of humble life is Mr. Orchardson's "Too Good to be True" (153), where an orange is offered by a good-natured old fruit-seller to a little child, who stands timidly clasping his sister's hand, unable to realise the wonderful fact; the natural way in which the incident is rendered gives an interest to the work, in spite of the dingy colour and blurred execution which more or less mark all this painter's works, and which we find it impossible to get reconciled to. In "Moonlight on the Lagoons" (229), the artist has realised an original effect; whether it is like moonlight is another question, but the picture is the reverse of commonplace.

Mr. Riviere will not injure his reputation by his picture of the "Last of the Garrison" (626), a large dog left wounded and dying on the staircase of a house that has been evacuated after an apparently vigorous defence; but it is not equal in interest to some of his previous animal pictures, and there seems too much canvas employed merely as a setting for the dog. But we look with more interest at the artist's "War-time" (89: illustrated by a verse from Sydney Dobell), because it is an indication of an extension of his powers, in presenting us with a human figure of real interest; his men having been hitherto mostly mere accompaniments to his animals. An old farmer, with a thin worn face, leans over the wall of a snow-covered field, holding the paper which has brought the news that "Tommy" is among the slain in some distant campaign. The old man is not strongly moved outwardly; he is simply broken in spirit. The picture is not intense, but it is perfectly genuine in its pathos, unforced and unpretentious, and will lead to a new interest in the artist's productions. As a work of somewhat kindred feeling, we may turn to Miss Starr's "Hardly Earned" (527), which we notice with a double pleasure, as marking the point at which a hard-studying, persevering young lady-artist has passed from the stage of promise to that of performance. Her own position has been "hardly earned"; she has been bettering it year by year, however, and this work, we think, fixes it. The single figure is that of a poor toiling young music-teacher or governess, who has taken off her damp boots, and fallen into uneasy slumber in her chair after a weary day. Nothing is slurred over in the execution; every detail helps the subject, but without in the least weakening the predominant interest of the figure, with the pale worn face in full light; the picture is one of real pathos.

Mr. Pettie, whose aim is satire and not pathos, has an excellent work here in "Jacobites, 1745" (1,217), his "diploma picture" on election as an R.A. The group of shabby-looking highland gentlemen collected in the middle of an empty hall to hear a mysterious letter read, while one of their number keeps guard in a ridiculously ostentatious attitude of defence and defiance in the doorway, recalls just such a scene and such actors as figure in the rendezvous at Ellieslaw's house (is it not?) in the "Black Dwarf." This is one of Mr. Pettie's best works in regard to character, and concentration and point in the composition.

* The fanciful superstition which gives the subject for this picture is incidentally referred to, without any explanation, in one of the best of Browning's shorter poems,—"Le Byron de nos Jours."

MASTERS AND MEN.

On the 7th inst., at the Central Criminal Court, Walter Hibbert, Adam Weiler, Richard Reed, Henry Ham, and William Alexander Matthews, charged with unlawfully conspiring together to molest and obstruct Mr. Edgar Graham and others, with the view of injuring them in their business as cabinet manufacturers, were found guilty, and sentenced to one month's imprisonment. The Judge (Cleasby), in passing sentence, said,—

"I cannot help thinking that the course which you pursued in this affair was harsh and injurious; it was not a few days that this picketing went on, it was pursued for a long time; and I do not know what would become of society if parties were allowed to watch and beset a person in his business. I can imagine nothing more annoying, and calculated to prevent him from exercising his free will, and certainly nothing more injurious to a master in his business, than to have day by day, morning and night, his premises watched, and workmen going in and going out accosted and pressed, and money offered to them, and, in some instances, threats held out to them, as has been done in this case. At the same time, I cannot help thinking that you did what you did, believing that under the law as it existed you were only doing what you had a right to do."

The Dispute in the Building Trade at Stoke and Newcastle.—The trade dispute between the master builders and the operative carpenters and joiners of the Potteries and Newcastle was brought before Mr. H. C. Greenwood, the stipendiary magistrate, recently at the Town-hall, Stoke, for arbitration. On the 5th inst., Mr. Greenwood gave his decision. The first question, he states, was that of the hours of work. At the present time the hours are from six a.m. to five p.m. all the year round, with the exception of Saturday. The masters proposed to make the following alterations:—That from the 3rd of February to the 8th of November the hours should be from six a.m. to half-past five p.m., and from the 9th of November to the 2nd of February from seven a.m. to five p.m., except on Saturdays, when work is to cease at one p.m. Among the reasons given by the masters in support of these alterations the chief was the great loss they incur in winter time, when practically the men do little or no work between six and seven or half-past seven a.m. On the other hand, the operatives gave as reasons for the retention of the hours that labour was divided more fairly, that there was uniformity, and that at a time of the year when their expenditure would be greater, they would, if the masters' proposal were adopted, earn less. Mr. Greenwood said it seemed to him that the present arrangement of hours did press unfairly on the masters, and that the alteration they asked for was only reasonable, and he therefore decided that the hours of work should be from the 3rd of February to the 8th of November from six a.m. to half-past five p.m., and from the 9th of November to the 2nd of February from seven a.m. to half-past five p.m., and on Saturdays to one p.m.

Strike of Glasgow Painters.—At ten o'clock on the 3rd inst. a mass meeting of the Glasgow painters who had not had their demands conceded was held in the Moulders' Hall. A lively discussion took place as to what course of action should be taken. Ultimately a deputation was appointed to confer with a deputation of the masters, and were invested with full powers. When the two deputations met in the Trades' Hall, the matter was fully discussed, and the result was that the masters agreed to give the advance of wages, from 7d. to 7½d. per hour; while the men, who had asked for a reduction of the working hours, from fifty-seven to fifty-four per week, consented to the hours being fifty-six per week, work being stopped at one o'clock on Saturday. On this result being announced to those who had waited in the Moulders' Hall, there were great demonstrations of triumph. The men resumed work next day on the new system, terminating a strike which only lasted one day.

Edinburgh Building Trade.—At a meeting of the Edinburgh master builders, held on the 6th inst., it was resolved to maintain within the city (municipal) boundaries the present agreed-on rate of wages of 8½d. per hour, while sanctioning an increase upon the rate of ½d. per hour which has recently been paid without these boundaries. Several hundred more men than can be got could be employed at the present time within the city.

Extraordinary Manifesto.—The following is a copy of a circular just issued by the Operative Bricklayers' Society at Blackburn:—

"*To Master Joiners, Masons, Architects, &c.*

We, the operative bricklayers, wish to inform you that no member of this society shall be permitted, under any circumstances, to contract for, either in whole or in part, any kind of brickwork that may have been contracted for or sub-contracted for under the original contract, nor shall any of our members work for any master who shall contract for such work. In contracts where the whole job is let together the original contractor must (unless he intends to employ men himself, then he will have to pay 6d. per day extra to our rate of wages) get a tender from some master bricklayer, previous to sending in his tender for the job, who shall be considered as being the original contractor in such case. Nor shall any of our men work on any job where the master mason allows his men to set brick, either on the job they are working at, or any other job that the master mason may be erecting at the time, or may have recently completed, unless such master mason shall have employed a member of this society to do the work; nor shall any of our members be allowed to work for any master joiner or builder (or work on any job where such master joiner or builder may have a contract) who employs masons or others not members of this society, to set fixtures up or do any other kind of brickwork where a bricklayer is required. This law is intended to entirely do away with second-yard work, or any one setting brick except those who have served a legal apprenticeship to the trade. And by strictly adhering to these rules you will oblige yours, on behalf of the Operative Bricklayers' Society,

JAMES WORSWICK, Secretary."

THE ARTISANS' INSTITUTE.

THE meeting held at Grosvenor House the other day in aid of this Association, when his Grace the Duke of Westminster gave his powerful help, was well attended, and the position of affairs was clearly stated by Lord Lyttelton, Mr. Samuel Morley—always earnest and sensible,—Mr. H. Pratt, and others. The response, however, in the way of donations was not very large. The Rev. Mr. Solly has always found strong backers, but we are forced to confess to our impression that the resulting good to the public has been scarcely commensurate,—at least, so it strikes us: plenty of talk, plenty of printing, plenty of repetitions of Mr. Solly's name, but nothing very good, large, and tangible to show as a result. We will take our own opportunity to look at what is being done, and shall be delighted if we find ourselves able to give heartier support to the new move in Castle-street than we can just now.

WOOD WORKING MACHINERY.

WE have received from Messrs. F. W. Reynolds & Co., of Southwark-street, a copy of their new "Illustrated Catalogue of Builders' Machinery and Appliances," from which we gather that they are fully alive to the increased necessity for labour-saving machinery. This necessity, which arises from the high rates that have so long been maintained in the labour market, is such that without machinery the money expended for wages often precludes the possibility of making profits. There are, of course, thousands of cases in which steam power is not available, and it is in cases of this kind that Messrs. Reynolds's inventions will be found more particularly useful.

The catalogue sent to us contains particulars of a sawing-machine which they call the "Eureka." It consists of a strong iron table with a circular saw on the one side, and a band-saw with canting table on the other. The spindle of the circular saw is raised or lowered by a hand-screw, so that it can be adjusted to the required height with the greatest accuracy. This machine is self-feeding, and can be worked either by hand or by steam power, and professes to answer every purpose of a small "general joiner." Among a number of new mortising-machines we notice particularly those which F. W. R. & Co. call the "Monarch" and the "Premier." The great advantage of the last-mentioned appears to be in the timber-carrying bed, which, besides moving horizontally and laterally, can be shifted to any required angle,—an arrangement which must be very useful for many kinds of work, not only on account of the time which it must save, but also for the exactness which it secures in cutting mortises at an angle.

While Messrs. Reynolds & Co.'s speciality still appears to be wood-cutting machinery, we see from the catalogue that they do not by any means confine themselves to this, as it includes drawings of mortar and loam mixing mills, both for hand and steam power, stone-sawing machines, paint-grinding mills, and a very large variety of hoisting appliances. It also contains particulars of horizontal and vertical engines and boilers, but of these we are not able to say more than that the prices appear to be low. The catalogue is illustrated by about one hundred engravings, accompanied by full descriptions. It is well got up, and should be in the hands of all builders.

HAMPSTEAD CHURCH.

IN our notice of Mr. G. G. Scott's design for improving the interior of Hampstead Church, now exhibiting at the Royal Academy, we expressed ourselves as scarcely able to deduce the amount of improvement that was intended. A little inquiry enables us to say that the plan was designed to meet the two great objections which have been raised against the proposals of the trustees of the Church. These objections are,—first, that they desire to destroy the tower,—the best feature of the existing church; and, secondly, that their scheme perpetuates the one great inconvenience of the present arrangement, namely, the position of the principal entrances at the same end of the church as the communion-table, so that every one entering the church is in full view of the whole congregation. To avoid these objections, and to diminish the outlay required to restore the church, was the object of the plan. Mr. Scott proposes to place the communion-table at the end of the church opposite to the entrances, and to throw out at this end of the church the apsidal chancel, which the trustees desire. By thus reversing the church, the necessity for destroying the tower, which many are most anxious to preserve, is removed. The west end of the church is modern, so that a chancel can be added at this end without any interference with the original structure. The fall of the ground, and the direction of the principal approach to the church, which is from the east, make it impossible to alter materially the existing entrances, so that the architect thinks it perfectly reasonable to shift the communion-table to that extremity of the building which is opposite to the main entrances. The only objection to this plan is the superstition that the Table must be towards the east, but archæologists are aware, he maintains, that in the early Christian churches the Holy Table was placed at the west end, and not at the east.

THE ARTISTS' ORPHAN FUND.

ON Saturday last, his Royal Highness the Duke of Edinburgh presided at a dinner, given at the Freemasons' Tavern, in aid of the Artists' Orphan Fund, a branch of the Artists' General Benevolent Institution. It may be well to explain that the appeal which was made to the profession and the public in 1871 to raise a separate fund, in connexion with the Artists' General Benevolent Institution, for the support and education of the orphan children of artists, was most liberally responded to. After the dinner, at which his Royal Highness the Prince of Wales presided, the amount of subscriptions was found to be 12,933*l*. This sum has been increased by various donations during the past three years to 13,483*l*., which has been invested in English railway debenture stock, producing an annual income of 570*l*. The usefulness of the fund has more than answered the expectations of its founders. The first applications for assistance were received in June, 1871, since which time fifty-two children have been either partially or entirely supported and educated by annual grants varying from 10*l*. to 40*l*., and at the present time the fund is providing for thirty-seven children. The committee, however, are unable to entertain more applications, as the income of the fund is exhausted by grants to the children now being educated, and they therefore call on the profession and the public for an increase to the fund.

The Duke of Edinburgh's appeal on the present occasion was most successful, and the large sum of 6,634*l*. was raised, making the total amount of the fund 20,117*l*. The other speakers were Sir Henry James, M.P., Mr. Horsley, R.A., Mr. F. Leighton, R.A., Mr. Arthur Sullivan, Mr. Pope-Hennessy, Mr. Godwin, and Mr. Cunliffe Brooks, M.P. The dinner was very numerously attended.

MORTAR, UNDER THE METROPOLITAN BUILDING ACT.

THE following memorandum from the Superintending Architect of the Metropolitan Board of Works, addressed to the District Surveyors, should have the attention of builders:—

A case has occurred at Hammersmith,* in which the District Surveyor has succeeded in obtaining a conviction against a builder, who constructed a building with refuse or earth, instead of mortar properly compounded with lime and clean sand; and I beg to call your attention to the circumstances, in order that you may be enabled to adopt similar proceedings, when any builder fails to amend his work or materials, when called upon by you to do so.

A house was built with mortar, mixed with mud and horse dung; and the District Surveyor summoned the builder to show cause why the building should not be demolished.

The Magistrate asked, What is mortar, and why it was not defined?

It was shown by reference to scientific books that "mortar" was a technical term, intended to indicate a composition consisting of two essential ingredients, lime and clean sand, in the proportion of one part of lime to three, and sometimes two, of sand, mixed and worked up with water into a suitable consistency to cause the layers of brickwork to be bound together when the mortar chemically sets. A definition of such a material was not deemed requisite, as properly-qualified persons were directed by the Act to be examined by the Royal Institute of British Architects, and could only be appointed as officers by the Board after obtaining a certificate of competency to perform the duties.

A specimen of the stuff was produced, and the magistrate said it was not, in his opinion, mortar, and was unlike anything he ever saw before. He therefore accepted the scientific opinion, and ordered the demolition of the work.

It thus would appear, that if a case is well stated, and its technical bearings explained, an effectual support of the public officer in the performance of his duty may be expected; and the builder who would tamper with the law, and produce an inferior structure, through insufficient materials or careless workmanship, would be checked.

Sometimes it is also alleged that the District Surveyor cannot control the brickwork used with or without bad mortar; but if care be taken to bring specimens before the magistrate, he cannot fail to see that if soft and defective or broken bricks are used, such bricks are not fitted to form bonded work, where strength and security of construction are demanded. If such materials were attempted to be used under an architect's specification, and contrary thereto, they would certainly and properly be disallowed.

SOMETHING LIKE TYRANNY.

A WORKING scissors-grinder in Sheffield saved up his earnings for the purpose of becoming a master-man in a small way. He bought the necessary machinery, and commenced to *make* scissors as well as grind them. On the night succeeding the day on which he commenced as master-man his workshop was broken into; his wheel-band cut into shreds; four "laps" and "glazers" destroyed; three grinding-stones smashed to pieces; and his little venture was utterly ruined.

The suggestion as to the cause of this un-English and atrocious act is, that he had not consulted the Sheffield Union, or got their permission to become master. We hope to hear some other explanation.

THE DRAINAGE OF PORTSMOUTH.

SIR,—In the description of the great and difficult drainage works at Portsmouth, in the *Builder*, your informant, although quoting my report of 1864, omitted to state that the general scheme was designed by me. After much local angry discussion and opposition, my scheme received the approval of the Secretary of State, of the Admiralty and War Departments, and of Sir John Hawkshaw as referee. In 1865 I turned the first sod, and, as stated in your description, the works have recently been completed under the able superintendence of Mr. Greatorex, the borough engineer, who has also designed many of the later details of my scheme.

The drainage of Portsmouth affords an exceptional example of flat gradients. I may also add, as a collateral fact, that the death-rate of the borough, with a population of about 120,000, is conspicuously low in the weekly return of the Registrar-General; in fact, Portsmouth is usually at the bottom of the list of the eighteen large towns: therefore those who desire a specially healthy and interesting watering-place cannot do better than visit Southsea, which forms part of the borough of Portsmouth, in which 160,000*l*. have been expended on drainage, while many of our popular seaside resorts are entirely without drainage.

LEWIS ANGELL, M.Inst.C.E.,
President of the Association of Municipal and Sanitary Engineers.

* Already reported in our columns.

ETON AND ITS COLLEGE.

THE fame of Eton as a town has been swallowed up by the renown of its college as the most distinguished public school in England; but the town existed several centuries before the college was thought of, and its existence is due to the foundation of Windsor Castle and the growth of new Windsor. When the Norman kings left the palace of old Windsor, and took up their residence at their new castle, they required a more direct route to London than the old one through Staines, and one of the results of the formation of a new road by Slough was the erection of houses from time to time along the road on the Buckinghamshire side of the river in continuation of the town of new Windsor. Thus a long street of houses gradually grew into the town of Eton. The manor originally belonged to Editha, the wife of Edward the Confessor, and was probably held by her, with all her other possessions, until her death in 1075. It was then granted by William the Conqueror to Walter Fitz-Other, and remained in his family for more than a century. There is no mention of any houses at this period in the Manor of Eton, but as there appear to have been two mills, it is probable there was some kind of village where the town has since grown up. As early as the year 1204, a charter was granted to Roger de Cauz for a market to be holden on Mondays. In the same year the manor was granted to William de Cantelupe, father of Thomas de Cantelupe, who was afterwards Chancellor to Henry III. Among the Fines of the twelfth year of King John's reign there are proceedings between William de Cantelupe and Walter, prior of Merton, relative to the advowson of the church, all right and claim to which the former relinquished to the Prior and his Church of St. Mary of Merton. The "mother church of Eton" referred to, stood on the site of King's Stable-street, but the inhabitants allowed it to fall to decay, and were contented to be allowed to attend service at the College Chapel. A chapel-of-ease was afterwards founded in High-street by William Hetherington, a Fellow of Eton College, and in 1851 a new parish church was built on its site.

On the 10th of July, 1359, William of Wykeham was constituted chief warden and surveyor of several of the king's castles and manors, and among the last was that of Eton. Near the middle of the fifteenth century, Henry VI. having from the very commencement of his riper age turned over in his mind how he could do fitting honour to "our most Holy Lady and Mother, so that He, the great Spouse of the Church, should also therein be well pleased," at last decided to found the "Kynge's College of our Blessed Lady of Etone besyde Wyndesore," which remains to this day a monument of his piety. Henry was a severe enemy of the doctrines of Lollardism, and one of his statutes required every fellow to swear that he would not favour the doctrines of John Wycliffe, Reginald Pewke, and other "heretics," under pain of perjury and expulsion. We have the king's own authority for the fact that he was long in making up his mind as to how he should carry out his object; but he lost no time when he settled the form it was to take. On the 30th of July, 1440, he visited Winchester in order to examine the plan of William of Wykeham's foundation there, and on the 11th of October, 1440, it having "become fixed in [his] heart to found a college in the parish church of Eton, near Wyndesore," he signed the charter of foundation. By this the college was made to consist of one provost and ten priests, four clerks and six chorister-boys, "who are to serve daily there in the celebration of divine worship, and of twenty-five poor and indigent scholars who are to learn grammar," also of twenty-five poor and infirm men whose duty was to pray continually for the health and welfare of the king while he lived, and for his soul when he died, and for the souls of the king's ancestors. The list of persons constituting the college ends with the master or teacher of grammar. The royal founder subsequently enlarged the members of his college to seventy scholars, and added to those already mentioned an usher, a parish clerk, and two more choristers; but he reduced the almsmen to thirteen. A Bull of Eugenius IV. sanctioned Henry's foundation, and an ample Papal Indulgence accompanied the Bull. Henry Sever was the first provost, and William of Waynflete the first master; but the latter very soon filled the office of provost, which Sever did not live to enjoy. The first stone of the chapel was laid on the 3rd of July, 1441, and the building continued slowly through several years. This beautiful piece of architecture is so well known and so highly appreciated that it is unnecessary for us to give any description of it; but as the names of those who were employed upon the works have been preserved, we set them down here in order that they may receive their meed of praise. Robert Westerly was the master-mason, who had power given him "to take as many masons wheresoever they may be founden, as may be thought necessary for the said works"; and John Beckeley, mason, was instructed "to take cariage and al other things necessary for the same werks." John Smyth was warden of masons, and Robert Wheteley warden of carpenters; William Lynde clerk of the works, and John Hampton, surveyor. Roger Keyes, as master of the works, gave such satisfaction to Henry that he made him a grant of arms. All the accounts respecting the expenses of the building are preserved in the college archives, and are of great interest. In the first year the wages of the workmen amounted to six, seven, eight, and nine pounds per week. In the second year the whole sum for wages was 712*l.* 19*s.* 1*d.*, and the whole expense for work and materials accounted for was 1,447*l.* 0*s.* 4*d.* The pay received by the workmen was as follows:—The freemasons were paid 3*s.* a week, without deductions for holidays; the stonemasons and carpenters had 2*s.* 6*d.* a week, if it was a week with one or more holidays in it, and 3*s.* for a week without holidays. The labourers had 4*d.* a day each, but were only paid for working-days. About the latter end of the second year of the building, a brick-kiln was finished at Slough, and bricklayers are then first mentioned in the accounts. They received 6*d.* per day each, with 2*d.* more to Robert Chirche, called the *Warden layeer and Brekelayeer*. The labourers were well looked after, and heavily fined for any fault. The following are a few of the fines:—For chiding, 2*d.*; for playing, 2*d.*; for letting [hindering] of his fellowes, 8*d.*; for looking about, 2*d.*; for telling of tales, 2*d.*; for shedding lime, 6*d.*" The record of the prices paid for the different materials is curious. The Caen stone, which was imported, cost from 8*s.* to 9*s.* per ton; the rag-stone, which was brought from Boughton, near Maidstone, cost 1*s.* per ton at the quarry, the carriage to London cost 1*s.*, and the further carriage to Eton 1*s.* 4*d.* a ton more. The stone for the ashlar work, which was dug at Maidstone, was wrought at the quarry by workmen at the king's expense. A hundred feet of ashlar cost 9*s.*, to which must be added 6*s.* 11*d.* for conveyance to London, and 6*s.* 8*d.* for further freight to Eton. Iron was brought from London at the price of 5*l.* and 5*l.* 8*s.* per ton, and lead from Derbyshire at 4*l.* the fodre. Many bushels of oyster-shells at 4*d.* the bushel were used—"they were only ye upper shells of oysters, and used where ye stones did not exactly fit, to thrust in among the mortar, and to key up ye work." The price of ale was 1½*d.* the gallon.

Eton College had no reason to rejoice when Edward IV. took possession of the throne, for one of his earliest acts was to divert property to the yearly value of one thousand pounds from the College of Eton to that of Windsor. In 1463 he obtained, by false pretences, a bull from Pope Pius II. for dissolving Eton College, and merging it in the College of St. George, at Windsor; but after strenuous exertions on the part of the authorities, the Pope issued a commission to inquire into the whole matter, and Eton College was saved. After this the college had few trials to pass through, for when Henry VIII. made his great ecclesiastical changes, it escaped molestation by acknowledging the royal supremacy on the 14th of July, 1534. During the Commonwealth the provost (Dr. Richard Steuart) was ejected, and the estate and profits belonging to the provost were ordered to be sequestrated. The election of scholars was suspended for some years, and several of the Royalist fellows were replaced by Parliamentarians. Prosperity soon, however, shone again upon the college, and few clouds have since passed over it. Its revenues have been continually increased by donations and bequests, and royal grants have encouraged it to acquire landed property. In Henry VIII.'s reign the college purchased certain houses and parcels of land of one Blackwell, under their real value, "it being part of the agreement that Blackwell should be prayed for *post mortem*." The list of provosts is a brilliant one, and contains the names of many eminent men. We have already mentioned William of Waynflete, the illustrious founder of Magdalen College, Oxford, and may now add Robert Aldrich, D.D., Bishop of Carlisle; Sir Thomas Smith, the first layman to hold the office, for whom Edward VI. wrote a dispensatory letter to the Fellows; Sir Henry Savile, the founder of the Savilian professorships at Oxford, who spent much money in establishing a printing-press at Eton, and Sir Henry Wotton, ambassador and statesman, who had Francis Bacon as an unsuccessful competitor. The Hon. Robert Boyle was offered the provostship, but declined it, and the poet Waller was appointed to the post, but rejected by the Chancellor because he was a layman. In 1864, when the Royal Commission, appointed in 1861, made their report, the Fellows who helped the provost in the government of the college were condemned to extinction, and the members of the new governing body have since been constituted *ex officio* Fellows.

The list of head-masters contains the names of several who have afterwards filled the office of provost. Dr. Edward Barnard, who governed by moral power, was followed in 1765 by Dr. John Foster, a strict disciplinarian, who might have been the original of the nursery-rhyme schoolmaster:—

> "Dr. Foster is a good man;
> He whips his pupils all he can,
> Out of England into France,
> With his rod he makes them dance."

Dr. John Keate, head-master from 1809 to 1834, was another great advocate for the birch, and his favourite expression was, "I'll flog you." The head-master's room is better known as the "Swishing-room," and there is placed the block where the young criminals are punished; for none but the head-master has the power to flog. When Henry VI. fixed the number of "poor and indigent scholars" at seventy, he probably little thought that four centuries afterwards there would be upwards of 900 additional boys in the school. The foundation-boys (of whom there are still only seventy) are called king's scholars or collegers, and the other pupils are oppidans (from *oppidani*,—townsmen). These latter boarded at houses in the town kept by dames or ladies authorised by the head-master to provide board and lodging. In course of time the assistant-masters, whose numbers increased with the growth of the school, began to keep boarding-houses, which are called tutors' houses, in contradistinction to dames' houses. Very few houses are now kept by ladies; but those under the control of the extra masters still go by the name of dames' houses. As Eton has received as pupils most of the scions of the best families in England, it is not remarkable that the roll of celebrated Etonians should be a long and brilliant one. The college does not forget her children, and those she is proud of are commemorated in various ways. In the upper school are eighteen busts of celebrities, among whom are Gray, who has immortalised the "antique towers" and "fields beloved in vain," Porson, Fielding, and Hallam; Chatham, Canning, Wellesley, Wellington, and others. Memorial stalls in the chapel have been dedicated to the "memorable" John Hales; Oughtred, the mathematician; Boyle, the philosopher, Lord North, Lord Grenville, the Duke of Wellington, the fourth Duke of Newcastle, who in 1829, founded the scholarship that bears his name; and others. This scholarship is the principal distinction that Eton has to give. Among the Newcastle scholars are the Hon. Sir Edward Creasy, the late Vice-Chancellor Wickens, Lord Lyttelton, and Professor Goldwin Smith. On the walls of the hall are portraits of celebrated collegers, including Sir Robert Walpole, Lord Chancellor Camden, Sir Vicary Gibbs, Archbishop Sumner, Lord Stratford de Redcliffe, Sir J. Patteson, and Sir John T. Coleridge. The Cust family have never been without a representative in the school since Sir Purey Cust was there in 1654.

In 1844 large additions were made to the old buildings, at a cost of about 20,000*l.*, nearly the whole of which sum was subscribed by old Etonians. The first stone was laid by the late Prince Consort on the 20th June, 1844, and the buildings were completed in the following year. Again in 1862-3 new schools were built, in order to accommodate the constantly increasing number of pupils.

One of the chief charms of Eton is the beauty of the neighbourhood; and the authorities of the college feared that all their quiet would be destroyed when a railway was allowed to come

near them. They therefore opposed all attempts to bring a line to Windsor, and were not satisfied with the proposal that it should come no nearer than Slough. Serjeant Merewether opposed the Bill of 1835 before the Committee of the Lords in the following terms:—"The Thames would be choked up for want of traffic, the drainage of the country destroyed, and Windsor Castle left unsupplied with water. As for Eton College, it would be absolutely and entirely ruined; London would pour forth the most abandoned of its inhabitants to come down by the railway and pollute the minds of its scholars, whilst the boys themselves would take advantage of the short interval of their play-hours to run up to town, mix in all the dissipation of London life, and return before their absence could be discovered." When the Act was passed, in 1835, clauses were inserted providing that no station should be made near Eton, and that persons should be specially employed to keep the boys off the railway. Such were the forebodings of our fathers, and we know how their prophecies have been falsified. Perhaps no school can boast such a playground as Eton possesses in her "Playing Fields," and there it is that the Etonian is seen to the best advantage. We all know the Duke of Wellington's remark, that "the Battle of Waterloo was won by the Eton Playing Fields," and in those words the Great Captain expressed that love of his old school that every true Etonian feels.

The boys are divided into wet-bobs and dry-bobs, or "boaters" *versus* cricketers. No boy is allowed to go in a boat until he has passed in swimming, and therefore the bathing-places are much frequented. One named "Italy" is used by those who are unable to swim; another,—"Acropolis," has a lofty mound for the purpose of taking "running headers" into deep water. These are for the third and fourth form boys; and the seniors have other places allotted to them. One of these is "Athens," which is the principal place for practising headers. Here the aquatic games take place, when medals are awarded for swimming, diving, and headers, the gainers of which are respectively styled the "Tachynectic," "Colymbetic," and "Cybesletic" Professors. So much for the water: we must now just notice the land sports. Cricket is of course the great game, and the captain of the eleven is an implicitly obeyed autocrat, but other games have their supporters. "Fives" or hand rackets originated in the bays formed by the chapel buttresses. The Eton game has its own peculiarities, which consist in the "pepper-box," a name given to the space between a buttress that is built out at right angles from the left side of all Eton courts, and a step that changes the level of the inner and outer parts of the court. These irregularities existed in the original court, and all the "Fives walls" since erected have been constructed in accordance with the chance model. In the Playing Fields is a long piece of wall which bounds the Slough-road, and this the boys have utilised for the purpose of playing a species of football peculiar to Eton, called the "wall game." No notice of Eton would be complete without some mention of the mound two miles out, which bears the imposing name of Salt-hill. Here for four centuries was held the "Montem,"—a time-honoured ceremony that was abolished in 1847 by Provost Hodgson. Much discussion has been spent upon the origin of the practice of going in procession to this place on St. Nicholas-day. It is generally supposed that the ancient form was a procession of the "Boy Bishop"; but why this spot was chosen is not so clear; it may have been owing to some feeling of reference, for the place was originally a tumulus. "Salt" was money exacted by the boys from the spectators to defray the expenses of the day, and to make a purse for the captain of the "Collegers" on his going up to the University. The custom had outlived its day, and few regretted its abolition. We were in the neighbourhood on its last occurrence, and have an indistinct recollection of receiving from the hand of youngsters to whom we had paid tribute on the road, a card (probably a sort of acknowledgment) headed "*Mos pro Lege.*"

Those who wish to make acquaintance with the present history of Eton, and to learn how the place and its neighbourhood look now, should obtain an elegant volume published last year, and entitled "Sketches of Eton." The descriptive notes by Mr. W. Wightman Wood, ex-captain of the Oppidans, are of much interest, and we have availed ourselves of them in the description of the school of to-day. The etchings by Mr. Richard S. Chattock are excellent.

FROM ROME.

Beginning very far back, the antiquary has tracked the history of amphitheatres down its polluted course. "Daniel in the lions' den" has done service in some instances as a starting-post; and from Daniel to the bull-fights of Spain he has frisked about in a stream of uninterrupted gore, but apparently still unsatisfied; for the most recent historian of the Colosseum hints at "other crimes besides those of blood," which that building must have been the scene of, but which (says he) will not bear exposure. But we will not follow the "hue-and-cry" of ancient Rome. Happily our business is not with what has happened in the Colosseum, but with what has happened to it; with what it is and what it was, and more particularly with those points of historical and architectural interest which are now emerging from obscurity.

In the last letter some reasons were given for believing that the amphitheatre was commenced by Nero. This is a matter of dispute; but whichever side of the question they incline to in this particular, doctors seem to be agreed as to the subsequent history of the structure, which we give in the briefest manner possible, as follows.

The vast external arcades (if not the whole building) were commenced by Vespasian A.D. 72, soon after the conquest of Jerusalem, which has left its record on the arch of Titus, close by; they were finished and dedicated, A.D. 80, by Titus, but not raised to their full altitude, with a lofty attic above the triple-storied arches, till the time of Domitian, between the years 82 and 96 A.D. The building was struck by lightning A.D. 217, and Dion Cassius, an eye-witness, states that the upper stories or tiers of seats were totally destroyed by the fire thus kindled; all the other parts being scorched, or more or less injured, though heavy rains were falling at the time. Its restoration was commenced in the reign of Heliogabalus, and finished in that of Alexander Severus, *i.e.*, between A.D. 222 and A.D. 235. It is evident, from the effects of the fire reported, that the whole upper story must have been originally of woodwork, nor restored in masonry till after the fire of A.D. 217. An earthquake did much injury to the amphitheatre A.D. 442; and the record of repairs carried out subsequently is before us in two inscriptions, now placed near the southern entrance to the arena, giving the names of the reigning emperors, Theodosius II. and Valentinian III., with that of the Urban Prefect, Rufus Lampadius, who ordered the requisite works. The building again suffered from the effects of an earthquake, about A.D. 508; after which other repairs were undertaken by the prefect, Decius Venantius Basilius, as recorded in two epigraphs dug up in 1813. In the eleventh century it was fortified; in the year 1130 the family of the Frangipani took possession of it as part of their fortress; in 1250 Brancaleone, one of those senators who ruled with a rod of iron, decreed and probably commenced the total demolition of the structure, which he held to be a dangerous stronghold of ruffians. In 1349 it was again much damaged by an earthquake, as Petrarch relates in his letters; but any damage done at that time was not likely to have been repaired, for in 1362 the whole building was declared public property as a stone-quarry for any of the nobility or clergy to use it for new buildings, and some of the largest palaces in Rome are built of its materials. The building was made use of for some time previous to 1540 by the Archconfraternity of the Sacred Standard for the performance of miracle or mystery plays, a vestige of which is the view of Jerusalem with the Crucifixion painted on the wall over the principal entrance then in use at the north end over the arch, and seen in going out as one looks up. These plays were discontinued on account of the sinking of the earth,—a fact worth noting in connexion with the present excavations. A chapel was erected within the ruins, 1675; about 1741 Benedict XIV. ordered all the ingresses to be closed with iron gates. The following quotation from a pamphlet published last week gives the next part of the history in a readable form, and without a very great amount of superfluous matter:—"In 1703 the building was again damaged by an earthquake, to what extent it is not stated; but it is evident that the great corridors and arcades and the front were not damaged. These rested upon the solid foundation of the tufa rock, as has been said; the only manner in which *they* have been damaged having been by the great Pontifical families of Rome. It is convenient to attribute this barbarism to the Goths and the Vandals; but the real barbarians were the great families from whom the Popes were chosen for many centuries," &c.

At last the Amphitheatre was reclaimed from spoliation, when Benedict, in 1749, caused to be erected the plain wooden cross in the centre, and the fourteen shrines to commemorate the fourteen times our Lord stopped on his way to Calvary.

The work of restoration was commenced by Pope Pius VII., in 1805, with the erecting of an enormous buttress at the southern side of the outer ellipse. In 1810 when Rome was incorporated in the French Empire, the governor, Baron Daru, placed the Colosseum under the direction of the Roman architect, Valadier, to carry on regular excavations, which were continued until 1814, and although not carried deep enough, they secured some interesting discoveries. Restorations have since taken place, and can easily be distinguished. But the greatest work of all, the excavation of the whole area within the walls to a depth of 20 ft., is now in progress, and is bringing to light much that is interesting, and much that is at present incomprehensible. Of this we will speak later on.

Before describing the materials of which the Colosseum is constructed, we ought as architects to pause on our way, for the sake of considering three little points. The first is with regard to "the countless holes which riddle the surface of the stonework," by which "a great deal of speculation has been occasioned," and which "puzzled antiquaries not a little." Now some of these holes will still no doubt afford a suitable ground of difference to the members of the archæological world of Rome; but they are unanimous now in their very recently-acquired knowledge that the great majority were made at a time when iron was of great value "in extracting iron clamps that bound the stones together, not one piece of metal being left."

It really is surprising that men considering themselves investigators should have been so long in making this discovery, and that when they do make it, they should describe it in such a slipshod manner as to talk about "clamps" "binding" the stones together, and to assert that not one piece of metal is left, when the following are the facts of the case:—We know a man, whether of stronger sight than others we cannot tell, who went to the Colosseum so profoundly ignorant that he did not so much as know that holes riddled the surface of the stonework; but he saw the holes, and took it for granted that they were made for the purpose of extracting dowels (not clamps) which had not "bound" stones together, but which had been used to prevent the blocks of travertine from moving horizontally under the thrust of the arches. Beyond this, he examined the holes, and had made out to his own satisfaction the form of which the dowels must have been, when he was rewarded for his attention by finding one of the dowels *in situ*, and on comparing it with the iron-stained holes which he had seen running upwards and downwards from the "countless holes," he found it to correspond exactly. He is now in a position to report that the majority of "the countless holes which riddle the surface of the stonework" were made for the purpose of extracting wrought-iron dowels about ¾ in. square, and rather less than 6 in. long, which were let equally into the abutting stones at a distance of 6 in., more or less, from the outer surface.

An oft-inculcated lesson is read, again, by observing that the expansion of these dowels has split some of the blocks from top to bottom.

The second point is with regard to the capitals, which are to be seen lying beneath the arcades of the building. Mr. C. J. Hemans, in his "Historic and Monumental Rome, 1874," writes referring to the restorations after the fire of 217 A.D.:—"Remains of the architecture of that period are now strewn around the arena; broken columns, cornices, &c., of marble and granite, also some of the marble tripods used for burning perfumes,—the columns for supporting the roof of a gallery carried round the highest part, and where the spectators had only standing-room. In these fragments we observe the characteristics of decline, as in the rude chiselling of Corinthian capitals, contrasted with other examples, here before us, of that order in its purity." These rudely-chiselled Corinthian capitals, however, turn out, on inspection, not to be Corinthian at all, but Composite, and as to their "rude

chiselling," the state of the case is that they have been merely blocked out, and for some reason or other never finished. If they were left in this condition because they were, as the author supposes, far from the eye of all but the plebs, they certainly show no characteristics of decline, but of great vigour of treatment. But, whether or not, it is rather hard on them to compare unfinished composite capitals with highly-wrought Corinthian capitals, and to speak lightly of them because there are points of difference; and it is even worse for Mr. Parker, not content with disparaging them before a most select audience, to photograph them as they do criminals in Newgate, and to pass them round as worthy of contempt.

There is one very curious capital lying there; but whether characteristics of decline are to be observed in it those must say who know when and under what circumstances it was designed, and the favour or disfavour with which it was received. It is very bad as a specimen of art regulated by the dictates of common sense. In general design it is a Corinthian capital, with composite and other detail introduced (at least, so it appears to have been, for it is a mere fragment at present); but its peculiarity consists in the pleats and folds of the acanthus leaves and volutes being indicated by a series of circular holes, varying in size to accord with the breadth of the recessed fold; these holes communicate with each other below the surface of the stone, so that the capital has the appearance of an ordinary piece of carving with the grooved parts bridged over with countless meshes, wider at the ends than at the centre. It was probably intended to resemble lacework, which it does to a certain extent, and who can tell under what circumstances it was made so. There is also there a blocked out Corinthian capital, which shows signs, not only of decline, but of fall, and that from a great height, for it is shattered most completely. The third point is with regard to the buttresses which have been built at different times to arrest the fall of the structure. It is the fashion among those who go to the Colosseum to see the "ruings," to hold up their hands and cry "Oh, horrible!" when they look toward these most appropriate masses of brickwork; but such people are not worth consideration from an antiquarian point of view. One deliberate old gentleman of this class, after contemplating the ruins to-day through his opera-glasses, arrived at the conclusion that it was a "nice place for the jackdaws." It is because the archæologists, a body of whom it is impossible to speak without respect,—it is because they have lent their voices in the same tune that we will say a few words in defence of these buttresses. That at the southern extremity, which abuts against the broken edge of the great travertine wall, from the top to the ground, is, to my mind, almost perfect, when considered in relation to the purpose which it serves. There it stands, looking as modest and unassuming as such great creatures often do; but still with an expression of great power, and with something of sublimity in its unbroken height. It makes no pretence to being part of the Colosseum; it has only "come to see what it can do." Those at the northern extremity are not so good; they form an oblique series, each story of the building having one, and consequently they seem to attempt to accord with the general design; but even these are inoffensive. What would people have?

From the skeleton history of the Colosseum, which has been given above, some idea may be formed of the extreme difficulty which the building presents to any architectural inquirer. So many times has it been injured and restored, as recorded by historians, and so many times besides it may have been injured and restored, that it is very hard to determine the date of some parts of the building as it now stands. The present excavations are bringing to light what some consider the channels for naval fights and the chambers in which the lifts containing the beasts of combat moved up and down, and others consider the casemates formed by the Mediæval defenders of the place. There is a wooden construction in the centre, which some speak of as the floor on which the Frangipani kept their power dry, while others term it the remains of a cradle for the ships when not in use. Your correspondent prefers to wait and watch, until he can base his opinion on satisfactory evidence, and in the meantime to turn his attention to those matters which, in their love of abstract speculation, writers have somewhat overlooked.

If any person wishing to know of what materials the Colosseum is constructed consulted the authorities nearest at hand, he would be told that the piers are of travertine, with vaults of tufa and brick, and with masses of brick and tufa built in between the piers. But if he wished to obtain more precise information as to the nature of these materials, he would find some difficulty in gaining his object, and this particularly is the case with *tufa*.

Some little research has failed to lead to the meeting with the word *tufa* in any Italian or Latin work; but whatever the history of the term may be, it is certain that what it stands for is a variety of the mineral known to Italian geologists as *tufo*, and that *travertine* is another variety of the same substance. This fact seems to explain the statement of an archæological author that "the *tophus* of Vitruvius is not the same as the *tufa* of Rome; but corresponds to the *pumex*. *Tufa* is called by Virgil and Pliny *tofus*"—for *pumex* being also another variety of *tufo*, it is plain that Vitruvius, Virgil, and Pliny all make use of the generic term corresponding to *tufo*; but whereas Virgil and Pliny happened to apply it to the species known now as *tufa*, Vitruvius applied it to the species known as *pumex*. Had the learned author continued his researches, he might have found the term *tophus* corresponding to *travertine*. Having pointed out that *tufa* is a variety of *tufo*, the next thing is to define what *tufo* is.

Tufo is the name given to certain deposits of calcareous or silicious matter precipitated from water, and also to the mineral formed by the matter ejected from volcanoes, and made compact by the action of water and its own weight. Thus, we have three classes of *tufo*, viz., calcareous, siliceous, and volcanic. Independently of the sedimentary deposits that succeed one another on the crust of the earth, there are found scattered here and there other adventitious deposits of carbonate of lime, which have been produced by calcareous springs. These deposits, some of which are known to be still forming, constitute the calcareous *tufi* that are found in many localities, and in extensive beds. They almost always contain organic remains, particularly those of plants growing in the neighbourhood, and sometimes shells both fluvial and terrestrial. Calcareous *tufo* is generally yellowish in colour, being light, and affording a good hold for cement. It is, when sufficiently compact, very suitable for building purposes; one of the most suitable varieties being *travertine*, the stone of which the great piers and arches of the amphitheatre are built. *Travertine* is more or less porous in structure, with fistular cavities, which often contain vegetable remains. In the best specimens of the stone, however, these cavities are filled with a calcareous concretion, which gives great additional strength. It abounds in the Campagna di Roma, and in other localities. The greater part of the buildings of Rome are constructed of *travertine* from the ancient quarries at Tivoli, from which name the word *travertine* is derived.

There are also more ancient travertines found in the post-cretaceous strata, and in general the name is given to all the limestones deposited in inland waters. The siliceous *tufi* are rocks deposited by silicíferous springs. As they are not met with in Rome we shall not stay to describe them, but pass on to the *volcanic tufi*. These have had their origin, as stated, in the eruptions of volcanos. They are divided into two kinds—*trachetic tufo* or pumice and the *basaltic tufo* or peperino, the former of which is composed of minute grains of pumice together with larger fragments, all united by an argillaceous cement, due, it may be, to a minute grinding of the material or to its partial decomposition. Its colour is yellow more or less dark or else deep brown. The vaults of the Colosseum are composed chiefly of this rock. Peperino is essentially composed of minute grains of basalt or *wache*. It is sometimes solid enough to be worked with the chisel, and it then owes its solidity to calcareous infiltration, its fracture is earthy, and its colour dark brown, grey, or even reddish.

These volcanic *tufi* partly form the seven hills of Rome, and are now known among us as *tufa*.

Explosion at Ironworks. — An explosion has occurred at the ironworks of Messrs. Wentworth & Co., Wandsworth-plain. It appears that several workmen were engaged in filling a casting for a pillar, when it exploded. The molten metal spread in all directions, and some of it fell upon the men.

ON ORIGINALITY AND PROGRESS IN MODERN GOTHIC ARCHITECTURE.*

THE first and warmest wish of the enlightened friend of the modern Gothic architecture, on a calm and dispassionate review of its career, must, I think, be that, no longer confining itself to the tripartite rectangle and spire, it break out into other and brighter forms, and show a greater variety of general outline and composition in its most important class of structures—churches; for most certainly those that are everywhere springing up in city and village are too much alike both in horizontal and vertical section; and this I imagine arises from architects ignoring what ought to be their constant aim,—beautiful outline; which not only gives scope for the highest architectural taste and invention; but it is where taste and invention chiefly find scope, and it is the first thing that the mind takes cognisance of, and chiefly in the parts that tower into the air above the general roof-line of a city; in which features it should be the aim of the architect to embody, if not the fairest forms wrought in fancy's loom, at least the most beautiful forms that masonry could rear up into the welkin. For the body of the building there are other shapes surely suitable for churches of the present day, which had better fall back upon some of the forms of the early church in different countries,—octagonal, square, circular,—as well as emulate those more beautiful shapes adopted by other creeds. I allude chiefly to the Mahommedan mosques, with their beautiful domes and minarets, the contemplation of which in various lands is not unworthy of the Gothic designer. They are at least calculated to excite regret that Mahommedanism should have monopolised all beautiful curved forms, and left the straight-lined ones to Christianity. Crowning such new geometrical compact forms, perhaps the most fruitful element, pregnant with fresh beauty and new combinations, is the dome, than which, covering a square compartment, nothing produces so fine an interior effect.

The grandest and most beautiful interiors and exteriors in the world are square or simple oblong or Greek cruciform spaces, as St. Stephen's Church at Walbrook, St. Sophia's Mosque, and the Imperial Mosques at Constantinople,—buildings most of them showing sympathy with and emulation of the greatest and sublimest works of God in nature. To these useful and grand forms which she could construct and decorate as consistently as any other, Gothic architecture should now occasionally betake herself if she would get into the path of true progress. The bending of the style to their embodiment would, I believe, go farther than anything else to pour new life and vigour into it. The question whether the dome would harmonise with Gothic architecture, the Mahommedans in India long ago settled; for, if it harmonise with their works, which it admirably does, it could not fail to be a welcome feature of a Gothic composition. It must be even more harmonious in an arcuated than in a trabeated style.

I have said nothing of the pendentive dome, nor of the combination of domes and semi-domes originated at St. Sophia's at Constantinople in the sixth century, and which, after slumbering for just a thousand years, were there revived by the Turks in the Mosque of Soliman in the sixteenth century. But these are forms which I believe the Gothic might appropriate with due modification, and worthily decorate, to the production of buildings that would shed as much glory on the style as any aspiring example of the Middle Ages.

But our steeples would not be so much alike if greater pains were taken to make them beautiful; which, considering their prominence—thrown up into the air only to be looked at—to be observed of all observers, and where they cannot be useful, they certainly should be more decorated by means of tracery and carved foliage, and more pleasing in outline; which reminds me how seldom the pierced lantern and lantern and spire, of which we have some beautiful examples, have been employed. But these structures are really captivating to the imagination. Such composition seem the palace-home for genii of the air and clouds, and to such the eye would be attracted ten times more than to the solid spire, and from them receive ten times the pleasure. All these would be sufficiently pyramidal and aspiring in character, or might be made so, and would point to heaven as unmis-

* By Mr. Samuel Huggins. Read at a meeting of the Liverpool Architectural Society.

takably as the simplest tower and spire; indeed, there are a thousand ways of producing this character without confinement to the tower and spire. Something is, I think, urgently called for to infuse greater variety into this class of structures; for the constant recurrence of the same unvarying forms in town and country becomes wearisome to the eye; from the monotony of which in some of our large towns, where, at least in manufacturing towns, they are, moreover, eclipsed in size and power by the tall chimneys, the ugliest of Wren's steeples, and some of them were ugly, would be a relief.

Spires and steeples of one type of form were never so numerous in Mediæval or any former time in any other country of Europe; and never did architecture run so counter to the analogy of nature as in their production. I appeal to all capable of making the observation whether it is not so. Think of the infinite variety with regard to form, colour, &c., in the natural features to which they bear the strongest analogy, that beautiful and poetic class of structures with which nature has everywhere adorned the earth, I mean trees, as well as those humbler productions, canes, reeds, corn, grasses, and you will be more likely to feel with me, that there is something wanting in modern Gothic architecture,—a style which in able hands is capable of vying with Nature herself in the production of a pleasing variety. Assuredly there are an immense variety of beautiful, curved and pointed, and aspiring forms,—far brighter forms than any that have yet appeared in Gothic architecture, Mediæval or modern,—equally appropriate, equally expressive, that could be found among the golden visions that lie mirrored in the soul's fairyland—the fancy and the imagination.

Recurring to the general form and character of modern Gothic churches, nothing would, perhaps, contribute more to give newness and improvement to exterior design than the introduction of the round or simply clustered column of the interior to play a part on the exterior,—I mean on the same full scale as the nave pillars within the building, and acting as supporting columns in arcaded porches, as seen in the Byzantine and Italian Gothic churches. I think this one of the most important improvements, one of the greatest steps in advance that could be made on the Mediævalists. It would be the acquisition of an important element of form, the column becoming as useful and effective externally as it is internally, and as it is in the Classic styles. The column so applied would have an ennobling effect upon any church, in proportion to the extent in which it was employed. It would give greater contrast and variety of form, and a brilliancy of light and shade which nothing else could give. In a cathedral the far advancing Galilee porch, composed of columns, would not only be useful, but have the finest effect on the whole composition. The angles of such porch or any porch, unlike the porches of the Italian Gothic churches, which look weak and are weak for want of abutment, should be buttressed. The introduction of this new element would give great impulse to ingenuity and artistic taste and invention; for the column is by no means a stereotyped feature, fixed for ever in one or two forms, Corinthian, Ionic or Doric, but full of life and elasticity, capable of being drawn out and adapted to any new circumstance. Indeed, in any style the column as hitherto known and used, the most elegant Corinthian column ever designed or executed, that of the remains of the Temple of Jupiter Stator, or even the best Greek examples, could be far outstripped and distanced.

In Corinthian columns, I consider, foliage decoration is too much confined to the head of the shaft. It should, I think, first appear at the base, and delicately adorn it at various stages, as preparation for its full development in the head.

I think the modern Gothic architects have not duly recognised in their works the difference between modern and Mediæval feeling on the subject of religion. Had they done so, a less measure of a vertical expression, and more of the horizontal, together with lower and broader proportions than are found in the ancient examples of the pointed Gothic, would have been exhibited. The edifices of the thirteenth and fourteenth centuries were in keeping with a religious enthusiasm, a public zeal or *furore*, in those times that no longer exists, and the style requires a lowering, a toning down, as it were, to bring it into harmony with our soberer, more rational, experience; which points to forms and proportions which, if not so significant of man's religious aspirations, are, perhaps, more symbolic of the "great and noble simplicity of the Gospel story." The same sound judgment and artistic power that so beautifully bent the Gothic to domestic purposes both in France and Italy, prior to the revival of the Classic Roman, carefully excluding all ecclesiastical character from it, is what is now wanted to be exercised on the style for its adaptation to the needs and spirit of the day.

Moller, in remarking on the Church of Bathalha, in Portugal, the roof of which is quite flat, covered with large stone slabs, complains that the whole form of the building, the pyramids and the small pointed gables with which the aspiring pillars are ornamented, are discordant with the horizontal termination of the nave of the church, and attributes it to the choice of a northern style in a southern climate. But the discordancy arises from the merely borrowing, without adapting the style to the climate and building materials of the country: a style that was as well fitted for southern as for northern climates; one, indeed, which arose in southern climates, and in its earlier states, as in Lombardy, was essentially a southern style. Even in a country so southern as Portugal, the serenity of whose skies, I believe, is not perpetual, a slight pitch, equal to what the Greeks, or even the Romans, used in their temples, might be introduced into their roofs without libelling the climate. Now, I believe Gothic could be brought down to even this low pitch of roof, and made perfectly harmonious with ideas awakened by the climate and aspect of nature in the country in which such roof-pitch was sufficient. The façades of the cathedrals of Orvieto and Sienna would have looked as well, if not better, with gables of lower pitch, which would have been more in harmony with the rest. All the smaller and ornamental features would, of course, have to sympathise in this reduction of pointedness in structural features; but there may be as many points, and as much increase of acuteness upwards, as in the Gothic of the North.

If Gothic cannot be thus adapted to a low pitch it has no business in the Peninsula or in Italy, and it must not be introduced into some parts of our colonies, as Australia or anywhere but in high northern latitudes; which to affirm would be to detract from its merits. But it can be. To the man who knows what style means, and how to handle it, nothing is easier than fully adapting it to any climate. It would go spontaneously, as it were, into the forms and modifications required by the exigencies of the climate, and gradually recognise every circumstance that, in the nature of things, is expected to exert an influence upon architecture. I believe the smallness of slates in the Middle Ages, requiring a high pitch in roofs, had something to do with the extreme verticality of the style; and, if so, the largeness and perfection of that roofing material in our day should cause a movement in the opposite direction. There would be no danger in rendering the horizontal tendency too prominent, because horizontal connexion belongs naturally to all styles, whatever degree of verticality they may affect, and because horizontal division into stages corresponds to and symbolizes the natural and proper growth of the building; though in no building, of whatever style, should the horizontal and vertical be equally poised.

Increased horizontality is the more called for in Gothic churches forming part of continuous street architecture, which is essentially horizontal, whatever the style. A Gothic church, placed between two rows of attached shops and dwelling-houses, and ignoring, as too many Gothic churches do in England, the horizontal principle of composition is utterly contradictory of the tendency and expression of all around it. To be edified or pleased by its peculiar religious character, so utterly inharmonious with its accompaniments, is absolutely impossible. So entirely is it out of its true place and element among the hills and meadows, rising above cottage gable, trees, and other kindred and analogous forms, or combined with those picturesque conventional buildings which the Mediæval architects could so skilfully group around it, that what strikes you most is its strange, disconsolate, and plaintive air. Such inconsistencies of character and association should be carefully avoided.

Gothic architecture has the advantage over the Greek in being richer, more expressive, fuller of natural life and variety, and consequently more powerful than the other to move the heart of the beholder; but if we could infuse into it some portion of the unity, pure symmetrical beauty, and intellectual repose of the Greek, it would be more perfect and satisfying architecture. It would satisfy the intellect as well as touch the heart and imagination, and commend itself better to the taste of the present day, which has been refined by Classic art and literature and various influences unknown to the Mediævalists. I believe this could be done, and I think, moreover, that the aim at this is one of the best means of progress that remains to the style, the true advancement of which requires that every purifying influence upon its detail and sculptural decoration be brought to bear upon it. Among the first of these is that of the symmetrical genius of Classic architecture and art, and the taste and feeling inspired by them and by the revived classic literature and learning, the streams of which have now mingled with those of the Gothic or Romantic for centuries, till the mind of classical antiquity has become part of the modern mind of Europe.

That the revived knowledge and study of Classic art should render our Gothic different to that Gothic whose architects had never heard of the Parthenon or Erectheium, is a position which seems to me to require little to be said in its support. The mind and taste of the unprejudiced architect,—and all architects must be unprejudiced if they would be great or truthful,—could not fail to be touched and chastened by the refined beauties of the Classic monuments, and rendered purer and more fastidious than they would otherwise have been. Such an architect, I believe, would imbue his mind with classic beauty to the same extent as a man whose sole pursuit it was; and this, if he is obeying his intuitions, and using the style with enlightened freedom, must of necessity communicate itself to his works, to the infusion into them of a tincture of classic feeling which must operate as a refining and beautifying principle, and be "like a vernal air imparting an odour of flowers," and render them more acceptable to tastes that have been purified by the study of classic poetry and literature and contemplation of classic works of art, and which has of late come to assimilate more to that of the inhabitants of the sunny South. His works would naturally retain a greater licence and wildness of composition and decoration than the classic genius would permit; but they would receive greater refinement, and would show more geometrical grace and precision, and other agreeable qualities that now distinguish Classic. Structural modes and principles would be carried out and expressed in them with the greatest consistent amount of formal beauty. I really question whether they would not exhibit an attempt at some of the optical and æsthetic corrections and refinements of the Parthenon; at least, I think their author would be inclined to try the effect of diminution and entasis on the nave-pillars of a church, or, in other words, turn the pillars into columns, as far as circumstances would permit, and keep more in view the classical proportions in these pillars.

In all countries styles of architecture have been more or less influenced by the proximity of others, which, in proportion to their fascinating power on the mind of the architects, have had an influence on their works. But not only have styles been influenced and changed by each other, but new styles, intrinsically beautiful, have resulted from the contact of two or more styles; and some of the most beautiful buildings in the world are those wherein the richer and happier fancy of the East has come to the aid of the soberer genius of the West. They are to be found in Spain, in Naples, in the Island of Sicily, and other places, where the most exquisite architecture has been generated by the mixture of that of the North, the South, and the East:—Greek and Saracenic feeling in decorative detail and colouring, with Romanesque and Gothic taste in composition and massing. With a religion sternly opposed to that professed by the people, the materials and elements of whose monuments, Roman and Byzantine, they wrought into and amalgamated with their own, the Saracens gave an entirely distinct character to their architecture in the last-named place, Sicily, and rendered it one of the most beautiful and interesting styles anywhere to be found. The very highest style of architectural beauty may be and has been produced by the felicitous combinations that arise from the junction or meeting of styles: grandeur of composition and mass from one, elegance of ornament from another, richness of colour of a third; while the union of two imperfect styles may be easily conceived to result in a third superior to either of its progenitors. What does not both the Gothic and Renaissance of Spain owe to the poetic feeling,

delicacy, and refinement that pervade it and render it so truly captivating, to the influence and infusion of the Moorish? All this will be fully recognised and profited by in the works of the sincere architect, in which, I think, would be seen a tendency of the style to what it would have been had it been developed for the same purposes, and under the same religious impulses by a refined artistic people, who, while strong in their aims at religious character and expression of the Northern races, could yet fully appreciate every beauty and grace of the Classic, such as the Lombards in Italy would have produced had they not been checked by the influence of the Classic races which remained among them. To such an architect the chief use of all styles and all things else is the perfection of his own architecture; for which purpose all the outward forms and images of things, the whole compass of nature, the entire circle of arts, will be laid under contribution.

Of all the features of a Gothic pile, the one that most loudly calls for the refining influence of the Classical style is the buttress. In the great Mediæval examples of this feature, it is considered a merit that it is of the form best calculated for successfully resisting the lateral thrust of the groined vaults; that it is formed and disposed in strict and literal obedience to the law of the resolution of forces, and, therefore, without waste of its materials, every particle of which is actively employed to the exclusion of any useless or expletive masonry from its composition. Now it appears to me that it is only in the comparatively prosaic works of the engineer, and not in every work of even that class of production, that strict economy of materials should be enjoined; and that a buttress or anything else fashioned with an eye to a material use only, and to the embodying of proof of dynamical and statical knowledge and skill, does not belong to architecture, which, as an art of the beautiful, requires a greater sacrifice to the sense of beauty than is involved in the mere carved adornment of the form arrived at by algebraic calculation. I cannot but think that the form itself should be modified by careful considerations with regard to beauty, a ray of which, says Emerson, outweighs all the utilities in the world, and made as beautiful as would consist with its fully and clearly expressing its office and purpose as a buttress.

While the law of forces should be kept fully and clearly in view, such addition of material, beyond what stability required, should, I conceive, be made, as would enable the architect to mould it into the greatest symmetry and grace of which it was susceptible, and enable him, in carrying it up from the ground, to avoid those irregularities which so frequently disfigure it, such as the one-sided set-offs, which are far less pleasing than the slope which is carried equally round the three sides, and less susceptible of effective and satisfactory decoration.

The Mediæval architects did generally go so far as to give the buttress less projection than the outward thrust of the vault required, and supplied the deficiency of lateral resistance by the perpendicular pressure of the pinnacle. This was done less for appearance, perhaps, than to prevent an inconvenient projection of buttress; but might not a further liberty be taken with it to make it more symmetrical and graceful, and consequently more a feature of fine art? Might we not further reduce the necessity for projection by giving it greater thickness or width, or by giving additional thickness to the wall? But there are examples to show that the buttress can be sufficiently lightened as it ascends, and with entire geometrical regularity, with but little sacrifice of material. There are, I doubt not, various ways of doing it; among the rest that of turning the upper stage diagonally, which gives it a piquant and pleasing effect. But whether much or little expletive matter be required for the purpose in question, as beauty is indispensable in architecture, we should be quite justified in giving it, as much so as in oratory for the sake of sound, and to satisfy the sense of hearing, in adding synonymous and unnecessary words to complete the roundness of a period. Or, as in poetry, in which similar means of effect are resorted to: even rhyme tastefully applied gives to a work an additional power of pleasing. But apart from these considerations, the love of variety,—of the new, the original, the fresh in design, of varying on what has been done before, should lead to some greater freedom than has yet been exercised by modern Gothic architects in the treatment of the buttress—a feature which, as it seems to me, must naturally purify itself as the style advances; a square buttress with one sloping set-off at a third of its height, and a second one disguised by a pediment, and finished above with a square crocketed pyramid, is a thing that, having been produced so often before, no architect should literally repeat in the present day. The turret-buttresses of Henry VII.'s Chapel, Westminster Abbey, show the superiority with respect to beauty of the octagonal forms over the irregular square ones, which are undignified objects for their elevated and prominent position. The clustered pinnacles at the angles, as at Lincoln, are very superior to the square. I think the plan adopted by the architect of the cathedral of Amiens of putting the buttresses inside the building, or rather the window-plane outside, using the buttresses as division walls of side chapels, deserving of consideration, as one by which much that is injurious externally to high-art qualities may be avoided. While he did not waste the buttresses, he gave a greater nobleness and grace—an unbroken simplicity and breadth to the outside. As wide-spreading buttresses were all occasioned by narrowing of piers and widening of windows for the purpose of displaying stained glass, their treatment in future, and so far the course of the style, should much depend upon the reception and fate of that element amongst us,—an element which cannot, I think, be consistently introduced to the extent it was in the Mediæval churches in any but Roman Catholic and high Anglican places of worship, on account of its diminution of the light necessary for the Protestant service.

But apart from this consideration whether unstained windows, with some portion of the fair face of nature in the shape of waving trees and shrubs peering in, would not be even more beautiful than stained glass,—have more an air of cheerfulness, not unfavourable to devotion, is worthy of consideration.

I have already mentioned flying buttresses, which, if Gothic be pursued with the right notion of the relative rank of science and art—making art the supreme, and constructive science but her handmaid, the reverse of which was the practice of the Middle Ages, we should seldom see, and when we did, they would not be straight common struts, but gracefully arched and pierced like those of Henry VII.'s Chapel. You would never see them on the body of large and noble churches, destroying their breadth and grandeur, as they destroy those of most of the great French cathedrals, which, as architectural compositions, might not inaptly be dedicated to the lame deity Vulcan.

I think our churches might be fringed and outlined above against the sky with more beautiful objects,—of higher class of sculpture than they usually are,—and that there is great scope for variation and improvement on foregone examples in the matter of buttress set-offs, parapets and finials, which should be brought more into the region of art; and that, in important buildings, statues, as at Milan, might more frequently be employed upon set-offs and as finials; and, as in pictures, the painters sometimes aim at developing some one quality in particular, so I would like to see in one a fine development of beautiful buttresses; in another, of windows in thickened walls, without buttresses, giving deeper and more powerful reveals; in a third a composition in which the window is omitted and light brought from above through the roof, which would give scope for the exercise of ingenuity and invention in wall-tracery, decoration and niche-work, sculptured symbols, &c. In such works we should have a chance of getting now and then a glimpse of something new.

Start not at the idea of a Gothic church without buttresses or windows. Surely there is nothing in the nature of the style that forbids skylights, which suggest at once whatever introduced the omission of the window; and as for the unbuttressed wall resisting the thrust of a vault, it is only the sacrifice of a little more material than usual to beauty, which is a primary object of art.

The Law of Conspiracy.—At a meeting of the London Trades Council on Saturday, the 8th inst., reference was made to the conviction of five cabinetmakers at the Central Criminal Court last week for picketing. It was resolved that a delegate meeting of the whole of the London trades should be convened to consider the case of these men, and to take measures for the amendment of the law of conspiracy.

FALL OF A BUILDING IN DOVER.

A LARGE building, recently erected in Dover for Messrs. Lukey & Son, wine and spirit merchants, suddenly collapsed on Wednesday in last week. The local *Standard* says,—"The site of the building was evidently at one time a bad one, the house which formerly stood there having given some trouble to its owner, Mr. Minet, and this no doubt attracted public attention to the building. The old harbour formerly ran a considerable distance into this neighbourhood, but the subsoil is about of the usual character in Dover,—a loose shingle. This of course made both architects and builder especially careful as to the base of their structure, and not only were the whole of the foundations on concrete, but the walls were carried up a considerable distance in the same material." The building was designed as a bonded store, and Messrs. Lukey had at the time of the catastrophe a large quantity of wine and spirits in the cellars. It was erected by contract by Mr. Adcock, and the architects were Messrs. Whitley & Fry. The whole contract amounted to about 2,500*l.*, Mr. Morland, of London, being the contractor for the iron girders and columns. The building was constructed to carry 900 tons, and was built especially for a store for seed for the Dover Oil Seed Crushing Company. The Oil Seed Company receive many thousands of tons of this and other seed, such as rape and linseed, for the purpose of expressing the oil and manufacturing cake for feeding purposes. At the time the building fell out it is supposed that there were about 700 tons of seed upon the two floors. It is supposed that the seed shifted, and thus caused sudden pressure upon the walls. What was the real cause of the calamity which has occasioned so much anxiety to all concerned we are not in a position at the present moment to say.

THE ST. PANCRAS EXTENSIONS OF THE MIDLAND RAILWAY.

THE CLEARING OF HOUSES AND WIDENING OF STREETS.

THE Bill of the Midland Railway Company, which, amongst other things, seeks for powers to construct what is called the St. Pancras connecting line, was before the Committee of the House of Commons for several days, resulting in the Committee passing the Bill, after having inserted a number of highly important provisions relating to the demolition of houses, the stopping up and widening of streets, and other powers sought by the company. The undertaking is one of great magnitude, and the Bill, as now sanctioned by the Parliamentary Committee, empowers the company to close no less than twenty streets and places, and demolish upwards of 300 houses in the neighbourhood of St. Pancras. The lands, houses, and other buildings which the Bill empowers the company compulsorily to purchase, are situated on the west side of the St. Pancras Station, extending northwards to a depth of 400 yards, from the Euston-road to Phœnix-street, and westward about 200 yards from Skinner-street, Euston-road, to Ossulston-street, and covering an area of about 15 acres in extent.

The Bill was opposed by the Metropolitan Board of Works; not, however, on its merits, but with the view of securing the widening of several streets in the neighbourhood of the company's St. Pancras terminus, where it is proposed to effect a great clearance of dwelling-houses; and the committee, after hearing evidence, introduced a clause under which the company, when they have acquired possession of the houses and buildings fronting to that part of Euston-road which lies between Skinner-street and Ossulston-street, shall set back the frontage line to Euston-road, so as to allow that portion of the road to be widened to 70 ft. The St. Pancras Vestry are to execute the works necessary for widening the road within eighteen months of the company giving them possession of the land. Another clause introduced by the committee obliges the company in a similar manner to set back the frontage line of Ossulston-street, between Euston-road and Chapel-street, so as to allow of that street being widened to 50 ft. In addition to the widening of the streets above named, the works in connexion with which are to be carried out by the St. Pancras Vestry, a further clause provides that the railway company, at their own expense, are to make Skinner-street, which is now only 30 ft. wide, 60 ft. throughout its entire length; to widen Phœnix-street to 50 ft.; and

also to extend Stanmore-street so as to form a junction with Phœnix-street. The company are not to be permitted to stop up any of the streets which they will be able to appropriate under the Act until they have completed the street improvements just named. The widening of Skinner-street and Ossulston-street will thus give two important main thoroughfares from the Euston-road northwards.

With reference to the demolition of houses in the neighbourhood, for the purposes of the undertaking, the Committee have inserted a clause to the effect that before taking fifteen houses or more, occupied either wholly or partially by persons belonging to the labouring class as tenants or lodgers, the Company shall give not less than eight weeks' notice of their intention, by placards placed in view of such houses; and a special clause provides that whereas the construction of the St. Pancras connecting line will involve the removal of a large number of houses occupied by the labouring classes, and as it is expedient that accommodation should be made for them, the Company, before displacing any such persons, shall provide sufficient accommodation elsewhere, unless the Company and such persons otherwise agree; and for the purpose of enabling the Company to provide such accommodation they are to be enabled to sell or let on building leases lands in Hampden-street and Ossulston-street, and fronting Phœnix-street, in order for the erection thereon of suitable dwelling-houses or lodging-houses; and the Company are further empowered to enter into agreements and impose conditions and restrictions as to the elevation, size, and design of such houses, and the extent of accommodation to be afforded.

PROPOSED EXTENSION OF THE BATHS AND WASHHOUSES IN ST. PANCRAS.

THE proceedings of the St. Pancras Vestry at their recent meeting, when the members, as a body, agreed that it was desirable to erect new baths and washhouses in other parts of the parish, in addition to the present public baths in King-street, Camden-town, afford a striking contrast to those of the Newington Vestry, which has just resolved not to erect baths and washhouses in the parish, on the ground that they would not pay, and that the rates would be increased in order to maintain them.

The report laid before the meeting stated that during the past year there had been 199,657 bathers, of which 69,580 were first, and 129,077 second class. As compared with the previous year there had been an increase of nearly 5,000 bathers. The receipts had been 3,694*l.* 7*s.* 4*d.*; the expenditure for instalment and interest on loans, 1,941*l.* 5*s.*; and adding the washing expenses, including 150*l.* for an addition to the building, the gross expenditure was 2,514*l.* 14*s.* 4*d.*, showing a profit during the year on the working of the establishment, of 1,179*l.* 13*s.* The total cost of the baths seven years ago, including the freehold site, was 23,000*l.*, and, towards the repayment of this capital sum, 6,520*l.* had been contributed from the profits arising from the working of the institution. The report further stated that the increase was going on at such a rate that there was not sufficient accommodation for either bathers or washers.

After discussion, the report was eventually adopted, with the distinct understanding that the subject of erecting new baths must very shortly be considered by the vestry.

INDIAN ITEMS.

MR. W. CLARK, the engineer engaged by the Government, having completed his scheme for the drainage of Madras, has left for England in order to submit it for approval to the Secretary of State. The details of his scheme have not yet been made public, but it is said that he estimates the cost at about 230,000*l.* In the event of it being sanctioned by Lord Salisbury, it is believed that the Government will avail themselves of Mr. Clark's experience both in organising the agency for carrying out the work, and subsequently as consulting engineer in England for the purchase of materials, &c.

Mr. Parkes, the harbour engineer, has also sailed for this country to arrange his plan of operations in personal communication with the India Office. The Madras papers say that it is likely that the Prince of Wales, during his forthcoming visit to India, will be afforded the opportunity of inaugurating the works in connexion both with the drainage and harbour projects.

The Justices of the Peace for Calcutta are talking of spending 200,000*l.* in obtaining an increased supply of water for the city, but considerable opposition is shown to the proposal, for it is believed that the present supply is adequate to the wants of the population. The Justices, however, have refused to sanction the use of meters to show how much water is used, and how much wasted.

A memorial obelisk, ordered by Lord Northbrook at his own expense, to commemorate the gallant behaviour of the faithful natives who fell at Lucknow fighting on our side during the Mutiny, is announced to be nearly completed, and will probably be put up in the autumn. Mr. Lewhillim, a Calcutta sculptor, is now engaged upon it.

A MONUMENT TO A WORKING MAN.

THOMAS RAMSAY, a representative English working man, is the first labourer that has had his good deeds handed to posterity by a fine monument, and which has been erected over his remains in Blaydon Cemetery, in the Palatinate of Durham. In unveiling this work an immense gathering and demonstration of miners, ironworkers, and building workmen assembled on the 17th ult.

The monument stands 25 ft. high, and 5 ft. 4 in. at the base. It is divided into three parts—pedestal, column, and canopy; underneath which is placed the statue of the deceased, with a crake in his hand, and a roll of bills under his arm, as he appeared when at the miners' meeting. The style is Decorated Gothic of a florid character, the columns having carved capitals, the canopy enriched with crockets, pinnacles, finials, ball flower, &c., terminating with a spire.

The inscription beneath the statue is:—"Sacred to the Memory of Thomas Ramsay, who departed this life May 8, 1873, aged sixty-one years. Erected by the Miners of Durham, as a tribute to his long and self-sacrificing labours in the cause of human progress. He was a zealous worker, a faithful friend, and a Christian patriot."

The monument is executed from Prudham stone; the carved figure from white Howorth; and the whole was designed and executed by Mr. George Burn, sculptor, of Newcastle.

"Tommy Ramsay," in 1863, commenced the work of organising the greatest trade-union in this country, and to his unwearied and self-sacrificing exertions the miners of England owe great and needed reforms underground. He commenced at a time when it was dangerous for a man to associate himself with, much less advocate, unionism; and at the end of the establishment of the union the combination of the coal-owners said to him, "Leave the county of Durham, and go anywhere you like. Whatever the cost may be, we will bear it." After this a reorganisation of the union took place, when the pit-owners discharged him from every mine; but his discharge from the pits awoke the whole of the pitmen of Northumberland, Durham, and Yorkshire, and Ramsay was at once made independent of masters. The turn of his corn-crake at any time brought up from the mines thousands of pitmen, and his humorous and peaceable addresses were greatly admired. At the great demonstration of miners in 1872, Ramsay brought tears to the eyes of his thousands of hearers by finishing his speech in the words of old Simeon, "Lord, now lettest Thou Thy servant depart in peace, for mine eyes have seen Thy salvation."

DISAPPEARANCE OF OAK TIMBER.

FROM statistics recently published it appears that oak timber especially is rapidly disappearing from Europe, although half of the area of Sweden, one-fourth of Norway, one-sixth that of Switzerland, and 780,000 square miles in Russia, are said to be yet in forest. The consumption of oak in France has doubled during the last fifty years; she requires 15,000,000 cubic feet yearly for wine-casks alone, 750,000 for building purposes, 600,000 cubic feet for her fleet, and 150,000 cubic feet for railway carriages. 800,000*l.* worth of staves were imported in 1862; 5,000,000*l.* worth are now needed. Since losing Alsace and Lorraine, France contains 150,000,000 acres; 20,000,000 of this surface is covered with forest. Holland and Belgium are nearly denuded of timber, and are large importers. North Germany is rich in forest, but within half a century has commenced to cut down young trees. Austria has sold her forests since railways have been introduced. In Italy no forests remain. Spain and Greece are almost woodless. The southern coast of the Mediterranean is almost forestless.

MESSRS. BROOKS'S OLD BANK, ALTRINCHAM, CHESHIRE.

THE accompanying engraving illustrates the bank lately erected at Altrincham. It is in the old "black and white" style of the ancient Cheshire buildings.

The lower story is in stone; the rest is of oak, filled in with plaster, and with brick backing. The roofs are tiled. The central portion of the building is a spacious room, 40 ft. by 30 ft., and 28 ft. 6 in. high, used exclusively for banking purposes, with oak-panelled ceiling and marble dado. There are rooms for the manager and the clerks. The basement is for documents, books, &c., in the centre of which is an isolated strong-room, with duplicate entrances. To the left of the bank is the manager's house, entered from the bank porch; and to the right is the residence of the chief clerk, the windows of which, as of the bank, are of ornamented glass, in pale tints, the clear plate being only used where necessary. The bank fittings are of mahogany and pitch-pine.

Mr. George Truefitt, of Bloomsbury-square, is the architect, who has designed the whole, including the ornamental glass, ironwork, gas-fittings, pavements, &c. Mr. Watson was clerk of the works; Mr. Cardwell was carpenter and joiner; Mr. Shelherne, the bricklayer; Messrs. Smith & Calderbank were the masons; Messrs. Bellhouse did the ironwork; Mr. Owen, the plumbing; Mr. Odell, the ornamental glazing; Messrs. Johnstone, Bros., the gas-fittings, and brasswork for desks; Messrs. Patteson, the marble dados, chimney-pieces, &c.; Mr. Naylor, the desks and counter; and Messrs. Hobbs, Hart, & Co., the strong-room doors, safes, and locks.

The building is at the corner of the Market-place, and occupies one of the principal sites in the ancient town of Altrincham.

TAVERN ARCHITECTURE.

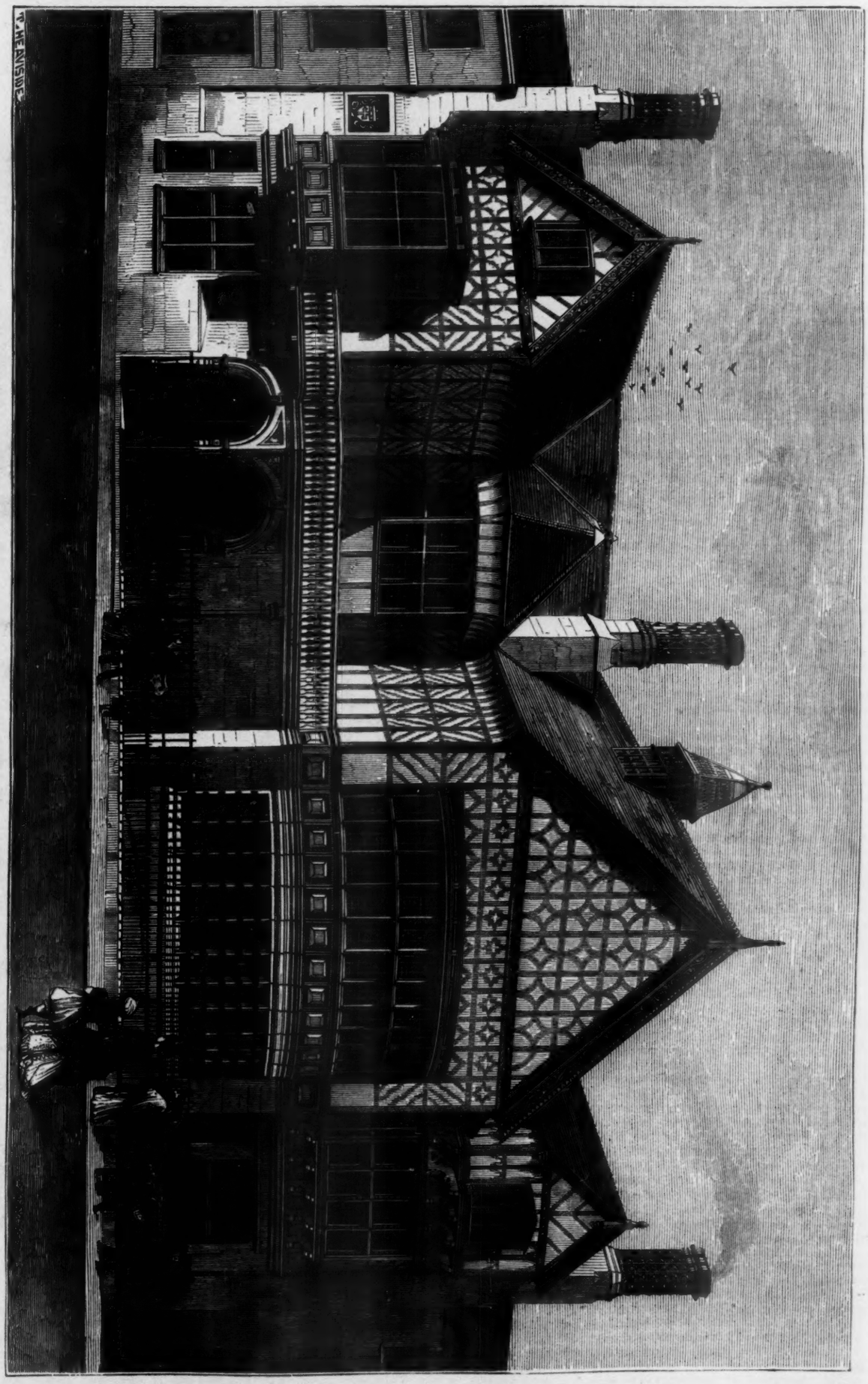
THE "HORSESHOE HOTEL," TOTTENHAM COURT ROAD.

THE building is designed to afford increased accommodation for dining and refreshment, and thus become an adjunct to the adjoining tavern. For which purpose, on the ground-floor, there is provided a large grill-room, similar in its details to those to be found in the City. There is a large *café*, and also at the rear a convenient *estaminet*. The extension of the luncheon-bar, the *café*, and *estaminet* are lighted by skylights, glazed with Hartley horticultural plate-glass, on which an ornamental pattern has been burnt. This work is executed by Mr. James, of Camden-town. On the first-floor there are dining-rooms for both sexes, while the upper stories are devoted to the purposes of an hotel; and that the accommodation of the building may be complete, in the basement are provided billiard-rooms and an extensive wine-bar. One of the features of the design is an attempt to carry all the horizontal decorations throughout the building, and thus the shop-front is divided by a rail of coloured glass, to match the Mansfield stone, while the lower portion, between this band and the plinth, is to be glazed with glass with burnt oak and dapha pattern; and the upper part is glazed with plate-glass, which is embossed, to match the sculptured ornaments on the pilasters. The front is of Portland stone, red brick, and Mansfield stone. There are zinc ornaments and dormer windows.

The builders are Messrs. Patrick & Son, who have carried out the works from the designs of the architect, Mr. Edward L. Paraire; the clerk of the works being Mr. Gladwell.

Failure of a Contractor.—At the London Bankruptcy Court on Saturday an application was made for the appointment of a receiver to the estate of Frederick Furniss. The debtor has presented a petition for the liquidation of his affairs, describing himself as a contractor, carrying on business at Victoria-chambers, Westminster, and estimating his liabilities at 35,000*l.* The assets consist mainly of a contract for the erection of a lunatic asylum for the justices of the county of Kent, the amount being for 30,000*l.* Mr. Beckwith, accountant, Aldermanbury, was appointed.

TAVERN ARCHITECTURE: THE "HORSE SHOE HOTEL," TOTTENHAM COURT ROAD.—MR. PARAIRE, ARCHITECT.



MESSRS. BROOKS'S OLD BANK, ALTRINCHAM, CHESHIRE.—MR. GEORGE TRUEFITT, ARCHITECT.

THE RIGHT WAY OF DEVELOPING ART;

OR, REASONS FOR THE REVIVAL OF THE ART-POLICY OF GREECE AND ITALY.

By W. CAVE THOMAS.

"IT will all come in time," said Foley, when we were discussing the best means of utilising the Slade Bequest, and were lamenting the want in England, of a better knowledge of the principles of art, and of a consistent art-policy.

The great sculptor was right; "it will all come in time,"—but the time would be considerably delayed if it were not for those restless beings, those pioneers, who are before their time, and who, having a clearer perception, a foresight of things to come, would clear all obstacles, at once and for ever, from the right and direct path. These obstacles, however, do not yield so readily to the axe of reform, and the ardent pioneer, not unfrequently perishes before he can clear the way through the tangled brushwood, and still more obstructive logs, which in seeming endless succession, thwart his daring labour. "It will come," we may rest assured,—the good time in art, as in everything else. But there is the becoming, there is the progressive development. It behoves us, therefore, to learn what is the essential characteristic of this becoming, this evolution, this progress. It is this that progress moves from narrow to broader views,—in science from facts to general principles,—in policy, from individual interests to class interests, from class interests to national interests, and from national interest to cosmopolitan or world-wide interests,—progress obeys a precisely similar law in respect to art, it moves from the petty to the grand; from the imitation of individuality to attempts at composition and idealisation, until it finally attains to the knowledge of essential forms; to the just conception of proportion and beauty, and the full power of composition and colour. The order of progression is, in fact, similar in all departments of human attainment; and as each section of inquiry arrives at that point where it is discovered that the study cannot be prosecuted alone, and as a completely isolated study, apart from everything else, but as a part of nature's great plan and whole together. I say when the various branches of study arrive at this conclusion, there is always an advance along the whole line of the intellect,—along the whole line of human thought,—to wider views, grander conceptions, and the consideration of vaster interests. Now it would appear to me that we have just reached that point in England both in art and in science; and when, in respect to art, we should take a broader view of its policy than to suppose that it is the duty of English painters now and for ever to confine themselves to the painting of detached easel pictures, and the cultivation of individual peculiarities of style. With all those wonderful displays of individual *tours de force* which may, from year to year, be contemplated on the walls of our exhibition-rooms, we have not, in the sense in which I understand these phrases, a national art-policy, or a national art. There is no evidence in the English school of that unity of action and collective effort which made the greatness of the Grecian and the Italian schools. There is as great a difference between the painting of an easel picture and the designing and carrying out of a series of works for a grand national building, as between the leading of a regimental company and the commanding of an army. And as in the commanding of an army councils of war must be held, so, in like manner, in the designing and carrying out of a series of monumental paintings councils of art must be convened, in order that any undue individual bias may be toned down, for the sake of a broader treatment and the general effect.

If we study the progress both of Grecian and Italian art, we shall not only find that there is a parallel development, whose stages exhibit similar characteristics, but that the art-genius of the two great epochs was developed by precisely similar means, viz., by the employment of the artist on the decoration of great public buildings. The only true way of developing any special study is, by making it worth men's while to give their attention to that study. All the finest remains of Grecian art in our possession were torn from the ruins of public buildings, and the greatest works of Italian art are for the most part incorporated with the walls of the great Italian monumental edifices. The greatest painters and sculptors were decorators,—remember this,—were decorators in the highest sense of that word; and beware of attaching any ignoble value, such as in the decadence of art, and the misapplication of the word in recent times, has come to be attached to the term "decorator." Let it also be borne in mind that it was through decorative art that Greece and Italy attained to the highest pinnacle of excellence. The value of the term "decorative art" has become, indeed, so depreciated, that architects, and a large portion of the public, really seem to think that "decorative art" ought to be an inferior kind of art; in connexion with architecture, therefore, both painting and sculpture are thus estimated, and paid for accordingly.

Seeing, then, that the history of art most clearly and unmistakably points the highway for the true encouragement and development of art, is it not time that we should forsake the byeways, and turn into the direct, main road? Instead of endowing art-schools and national galleries of the old masters, take the same highway to excellence as they did in times past, and endow painters and sculptors by commissioning them to execute public works? Compel our painters and sculptors to aim at the highest mark, and all branches of art would benefit by the new policy. Men would be made great painters and sculptors without huge national galleries, and designers for the manufactures without schools of design, as painters, sculptors, and designers were made of old time. We begin at the wrong end, and appear to be trying how not to do what we say we most earnestly desire to do.

It may be quite true that in modern times we must take cognisance of and cater for the sight-seers, and that a national gallery of the old masters is one object of attraction; but might we not have a national gallery of a different kind, equally attractive, far more instructive, and one which would exercise far greater influence on national art—a national history gallery? But on this point we will presently enlarge.

In considering the question of national galleries we are again led up to the truth, the great and important truth, that it was by means of employing Italian artists on great public works that the fine arts were developed in Italy to their highest pitch of excellence, and that the national encouragement of monumental art is the true art policy.

By a little effort of the imagination, too, we shall perceive that every public edifice of mark in Italy became of old time a living school of art in which the master revealed his experience to his scholars, the principles on which he worked, as well as his technical knowledge. Thus the experiences of many great minds were disseminated, traditionally handed down and improved upon from age to age; but in England every eminent man's experience dies with him, so that English painters waste half their lives in working out for themselves what might, under a different and better state of things, be imparted to them by others. The kind of art school just described is, I think it will be admitted, the true thing, and I will venture to affirm a far less costly means of developing art than planting expensive schools and galleries here, there, and everywhere, perfect in their appliances, but lifeless and inadequate for the purpose we have before us. Artists and designers of real, first-rate excellence were never, and never will be, made by these means; whereas everything artistic, upon the true system, assumes, in every phase of art, its right order of interdependence and gradation.

In the preceding remarks I have had occasion to use the phrase "monumental art." I once used the same in a title to a work which I called "Mural or Monumental Painting: its Aims and Methods;" but, to my dismay, I afterwards found that there was a very general impression that I had been writing upon the methods of colouring monuments and tombs, and that my work was devoted to that subject and not to the greater theme of the decoration of great public buildings,—to that kind of art which, by its elevation of style and its association with the natural architecture, becomes monumental, the best record of its existence and aspirations. A French writer, commenting on the great picture painted by Paul de la Roche in the "Beaux Arts," at Paris, says, "When first the architect opened to the painter the doors of a recently-finished edifice, and showed him the walls which were to be adorned by his skill, an elevated art arose, the essential principles of which were at once defined by the conditions of this union. This art may be called mural, or monumental painting. The characteristics are so pronounced, and so distinct from easel-painting, that perhaps the relation between the two might be aptly expressed by the circumstances attending their respective modes of execution, by comparing the durable walls of a temple with the fragile stretching frame under which the easel trembles."

Monumental painting, then, being employed to decorate large and solid surfaces, the artist is no longer intent on the reproduction, however ingenious, of reality in its most limited sense. A dignified subject is essential; and to this genius is required to add ideality or elevation of treatment. Lastly, simplicity, the indispensable characteristic of great works, must be apparent in the composition and the execution. Hence arises the especial condition of excluding from mural or monumental painting all that may interfere with grandeur of effect,—all that aims at literal imitation and illusion. It is to be remembered that the painter is, in this case, not alone; his art is employed, together with the work of the architect, in decorating the same interior. There ought, therefore, to be no difference of purpose between those two exponents of one and the same thought. Although it may suit modern requirement to sever art into specialities, art itself is one and indivisible. It is further to be remembered that the walls must always be felt to exist under the decorations that cover them, and the skilful and magical effects by which the painter of cabinet pictures gets rid of the surface would here be out of place.

Thus, under whatever point of view this question is considered, monumental painting must still be limited to an elevated region, where all is grand, simple, and unaffected. It was thus that its style was defined by the great masters who, from Giotto to Michelangelo, covered the walls of the palaces and temples of Italy with their works. They painted in fresco; and Michelangelo, foreseeing the decline of the grandest style, and the superior energy and self-denial required of its votaries, had reason to call easel-painting an occupation for women. From this period (the middle of the sixteenth century), the tradition of elevated art was unstable. Succeeding painters, down to Pietro da Cortona, poured over vast surfaces their crowded compositions, in which the qualities of fresco became useless. To complete the decline of monumental art, it remained only to neglect the process itself. Accordingly, from the beginning of the seventeenth century oil painting was introduced, commonly on walls, particularly in France; and the artists looking on this mode of painting as an opportunity for displaying the effects of foreshortening, perspective, and colour, produced what the Italians called vast "machine," differing only from the decoration of the theatre by better studied forms and a more finished execution. We have no right to consider modern artists responsible for this practice: it is to be dated from those painters who first lost sight of the conditions which regulate the style of painting when that art is applied to architecture. It is from the point of view which has just been indicated, viz., the union of painting with architecture, that the genius and labours of the band of painters who revived mural or monumental painting in Munich ought to be estimated. They were great artists in the best sense of those words, for they identified their art revival with a newly-awakened yearning after a united national existence; and thus, being far-sighted patriots, they contributed more than even their own countrymen are aware to the realisation of United Germany. There may be a clever display of individual effort, but never a grand manifestation of art, till a people is moved by one desire, and all talent is concentric to a common purpose. Do Englishmen ever ask themselves, whither bound,—to what end—are art, literature, and politics tending? Have they any part to play in the world's history, and what? If we cannot answer these questions satisfactorily, may it not be said that we are merely beating the wind, and that, like all aimless trifling, it will bring us either into mischief or contempt? It is unity of purpose which gives strength to a nation in literature and art, as well as in policy, which makes it great, and leads it to raise an enduring monument of art.

The numerous public edifices which have of late been completed in France and Germany, have almost in every case been embellished with the productions of painting and sculpture. This application of the imitative arts has prompted inquiries into the principles which may regulate the adaptation of those arts (especially of historical painting) to architecture; not without reference to the examples of success and failure which the decorated buildings of former ages present. The same question which is now pro-

posed for solution has been considered and practically answered, with various results, in Munich and Paris. The experiments which have been made in those cities by artists of eminence, and the opinions that have been expressed thereupon by competent judges, form, therefore, an important addition to the evidence of older works of art, and may assist in the examination of the subject.

The union of painting with architecture supposes a principle of adaptation or selection in the style of one or both. The architect, in arranging his spaces, might find it advisable to adapt their size to the distance to which the spectator could conveniently retire to contemplate the paintings; or might be induced to vary the form of such spaces, with a view to certain subjects. The principle of adaptation is most indispensable for the painter, for if, in such a combination, the production of painting should appear as adventitious ornaments, varying according to the taste or caprice of each artist employed, the result might be a mere gallery of pictures. This mistake, to a certain extent, seems to have been committed in the Church of the Madeleine in Paris. The defect is said to be the more striking, as the subjects of several of the paintings relate to the life of the Saint, who, according to the conception of each painter, is represented very differently. In such an assemblage of pictures, whatever might be their degrees of merit, the spectators would look in vain for any evidence of a similarity of aim.

In comparing the treatment of a cabinet picture with that of a work of the largest size,—for example where the figures are colossal,—it may be observed that the small picture, besides being executed with delicacy, generally exhibits a certain fulness of detail, while the large work is not only less elaborate, but is composed of fewer parts. Even assuming the same subject, and one requiring a variety of minute accessories, to be represented on a colossal and on a small scale, it may be safely affirmed that the degree of detail which would be admissible in the small picture would be objectionable in the larger. In a grander and more ideal subject, where such detail would be inadmissible under any circumstances, the comparison could be less fairly made, but a similar influence would be more or less apparent. Thus, assuming these conditions to be common, the greater space never allows the introduction of *more* detail than the smaller, but generally, if not always, requires *less*.

Without entering into the examination of this question as connected with the laws of vision, it may be remarked that, although the indistinctness arising from distance may be counteracted, as regards the most important qualities in art, by increased dimensions and by appropriate style and treatment, it must still tend to exclude certain refinements of imitation which are appreciable in pictures requiring to be seen near,—refinements capable of conferring an interest on details that may be unimportant in themselves. The inference is at once applicable to the question proposed. The familar subject, being fullest of accidental circumstance, must be displayed in dimensions fitter for near inspection; and with respect to an advanced state of art as regards imitation, excellence must be a consequence of the habitual adoption of such dimensions; on the other hand, the larger the figures in a picture the greater the distance at which the work must be seen; and as the omission of detail is a consequence of that reduced scale of gradation which distance supposes,—as the absence of minute particulars is felt to be the attribute of distance without reference to the size of objects,—so the accessories in the larger work of art require to be few and unimportant. Thus again, increased dimensions, by involving the suppression of detail, suggests subjects of corresponding dignity.

Such appears to be the relation of dimensions to style and subject, considered with reference to technical results; as regards the question of taste, it may be observed that the involuntary conclusions derived from the influence of association agree with the practice of art. The analogy between grandeur and the absence of detail, and between minute circumstances and familiar incidents, is sufficiently apparent. With these analogies the impressions produced by magnitude and its attributes, and by the opposite qualities, respectively correspond.

The general relation thus defined has often been reversed in works of art, but not with equally good results, for it may be remarked that large works, when elaborate in detail and full of accidental circumstance, have the unpleasing effect of magnified cabinet pictures; on the other hand, diminutive historical works, when treated with the breadth belonging to the grandest style, must give the impression of large works diminished. The last-mentioned inconsistency can hardly be an objection; grandeur of conception and treatment must unquestionably be acceptable in any form, but, nevertheless, the abstract breadth of imitation which is indispensable in elevated subjects is, under the circumstances, supposed a kind of contradiction, inasmuch as the vague generalisation of a distant or ideal effect is submitted to close inspection, and can only be so viewed. The small pictures of Raffaelle and Corregio are of this description; but the instances of such subjects being treated on so minute a scale are not frequent.

It is unnecessary to enumerate other exceptions, or to refer to larger works in which a just adaptation of style may have tended to obviate an incongruity between subject and dimensions. It may be sufficient to have dwelt on those plainer principles which result from the technical and external conditions that have been considered, but which may afford a criterion with regard to some of the more arbitrary convention of works of art. It may be added that even extreme conclusions which might be deduced from the conditions referred to, are strictly conformable to the authority of the grandest examples of art. The loftier aim of imitation, thus defined, may seldom be literally compatible with the usual range of subjects; but in this instance again, the criterion as such may be admissible. Thus, assuming the representation to be dilated to its full measure, details of costume, illusion, and even the more delicate varieties of colour, are no longer fitted for the dimensions. But in proportion as the subordinate excellences of imitation are excluded by the nature of the existing technical conditions, the display of the nobler qualities still attainable becomes more necessary. As the resources of art become circumscribed, the artist's aim becomes elevated. In the highest style of painting as in sculpture, the representation of inanimate substances ceases to be satisfactory when they no longer assist impressions of beauty or grandeur; and the styles of art in which the living form can be least dispensed with, are precisely those which, by the abstact character of their imitation, render it least objectionable.

The foregoing considerations may warrant the conclusion that the grandest style of art is best displayed in large dimensions. It will also follow that the treatment of subjects fitted for such dimensions must tend to ennoble the style and taste of the artist.

The very necessity which exists for studying the drawing and composition of large mural paintings, separately in cartoons, is in itself a highly beneficial training, as the mind of the painter being freed from the blandishments of colour and effect is the better able to concentrate its attention on the perfections of form. Monumental painting has thus earned for itself the title to be included amongst the plastic arts. In the cartoon the artist determines his composition, studies every portion of it from models; in fact, makes a work complete in every respect but that of colour, an exact working drawing. But although monumental painting admits of the design being studied to any extent in cartoons, yet in its ultimate execution it is not an art for the hesitating and timid. It requires a grand style of drawing, a broad and simple treatment of colour, an eye steadily fixed on the whole effect and an energetic and rapid hand, all qualities which it must be confessed, are rare in these days. Palomino, in his work on fresco-painting, referring to the methods taken by the painters of the "Decadence" to evade the study and care which it demands, observes, in speaking of Michelangelo and Raffaelle, that since their time artists had become impatient of so much toil, having found that their enthusiasm evaporated before the period arrived for the execution of their work. The best Italian mural painters were always fully impressed with the necessity of adapting their works to the architecture, so as to make one harmonious whole. The nature of fresco fits it for such a purpose. It is indeed impossible to produce that illusion which is considered so desirable in oil pictures. The same depth of shade is not in the artist's power, but this very circumstance, while it compels attention to composition and form, indicates the proximate limits of colour and effect, renders fresco more directly appropriate for strictly decorative purposes.

The absurdity of painting in oil upon walls into the composition of which lime has entered is so evident that it can never be attempted again. The lime and its salts are certain to cause the rapid decomposition of such works, which usually end in turning perfectly black. The inclination of oil colour on plaster is always towards the dark and heavy, whereas fresco has the reverse tendency, or to become lighter, and though this is also a defect, it must be admitted that it is the lesser evil of the two; for the gloomy depth of the changed oil colour breaks up the architecture by producing the effect of deep recesses in the wall, whereas fresco, though it becomes lighter, never destroys the breadth of the wall surfaces.

As, therefore, works upon the scale we have been describing cannot be often in demand for ordinary dwelling-houses, it is important that mural painting should be encouraged in churches and national municipal public buildings. On ordinary occasions the imitative arts may be considered as adventitious embellishments; but in proposing to adorn an important national edifice, where it is essential that a characteristic unity of design should be maintained throughout, painting should appear as the auxiliary of architecture. It was thus that it was employed in the best ages of Greece and Italy, and it was thus that its highest development was insured.

Having now briefly scanned the objects, the principles, and even trenched upon the pitfalls, of monumental painting, we may proceed to glance at the causes which have so long prevented its development in England. It was enough for the Spirit of the Reformation to know that the Roman Church had been the foster-nurse of art. It was, therefore, in the bigotry of its reactionary violence opposed to art, and the Church in England, true in the main to her traditions, although she no longer proceeds to overt acts, is, even unto this day, iconoclastic in spirit. The march of intellect, however, has doubtless convinced many in this country that the Reformation, in its antipathy against and raid upon art, ran into absurd extremes. There are not wanting, indeed, unmistakable signs that the pendulum of opinion is on the turn of oscillation towards art in our churches; and when we shall have succeeded in showing, as undoubtedly we shall do, that this may be done without reverting to discarded doctrine, the rate of this reactionary beat toward monumental art will be accelerated.

But sectarian rancour can frame no kind of excuse for excluding mural painting from our great secular edifices. The causes militating against the adoption of the new art-policy are the utter ignorance of the English people of the vast superiority of that policy, and their niggardliness in respect to grants for artistic purposes. There is at present an almost utter ignorance in this country regarding all that concerns monumental painting, and of the mode of properly carrying out a great work of mural decoration. Of this we have recently had painful evidence in the case of the recent proposal to decorate St. Paul's. If we only understood the true art-policy and the economy of that policy, all our great public buildings would soon be transformed into national galleries of the right kind; galleries in which the people would take far greater interest than in old pictures, with which the thought and feeling of modern times are no longer *en rapport*. The painter and the thoughts painted would be living,—of the people's own time. We should then soon have to remark a change, and that these new national galleries would not be frequented with listless loungers. We should note the attitude of attention and observation, the eager eye, the animated converse. Then, indeed, there would possibly be instruction if, in the commencement of the movement, there were but little art.

But it would not be very long before there would be art as well as instruction. We, in our stupid way, wait for Michelangelos and Raffaelles to spring out of the schools of the Royal Academy, or the Science and Art Department, or our National Gallery; whereas Italians were content to take the Cimabues, Giottos, and Peruginos which they had, and the Michelangelo and Raffaelle came in the natural course of progressive development. There is no single historical instance of a nation arriving at one bound to the zenith of artistic power. Considerations of this kind, together with a full conviction of the importance of a change in our art policy induced me some time since to put forward a project for a Natural History Gallery, whose walls should afford ample space for the display of mural or

monumental painting. I proposed that this gallery should be formed of a succession of spacious halls, each of which should be devoted to a series of pictures illustrative of a period of English history, the antechambers to each hall or gallery to contain a collection of the antiquities of that period. Between the paintings I proposed that there should be statues of the most remarkable men of that particular epoch, and that the whole series of pictures, sculptures, and galleries should be linked together with architectural skill. The mural paintings and sculptures in this National History Gallery would, in fact, form a complete series of illustrations of English history.

Our object should now be to find opportunities fit for the display of historical painting on a large scale; for this is precisely the class of painting which, more than any other, requires encouragement beyond the means of private patronage. The want of such encouragement has long been regretted, not by professors only, but the few who have turned their attention to the state of painting in England,—a proof that the promotion of historic art is an object of interest with at least some portion of the public. The decoration of public buildings with a view to moral or religious purposes has always been necessary for the formation of a school of historical painting. A national history gallery such as that described would supply some of the space so much needed, and would be admirably adapted to initiate the new and important art policy now advocated. Churches and public buildings have still their gates closed against monumental art. This project of a national history gallery affords the opportunity for making a flank movement on old notions, which would, I firmly believe, have the effect of "opening up" not only our secular but ecclesiastical edifices to monumental art.

In all periods of national, and consequently of architectural magnificence, mural painting and sculpture have, in a greater or less degree, played a conspicuous part in monumental art; and we may learn from the architectural remains of past civilisations the reasons for encouraging monumental art,—1st. As a memorial of national existence; 2nd. As the record of the aspirations of that existence. It should steadfastly be borne in mind that monumental art, in its highest development, exercises a dominant influence over all the subordinate arts of design, binds all the fine arts together, and gives them a certain unity of purpose which spasmodic art, originating in individual and isolated culture, never can. It is not from any prejudiced spirit which would banish all forms of art but that of the highest, that these remarks are made, but in the firm conviction that the cultivation and encouragement of the most elevated style of art favourably influences and exalts the subordinate, and raises the art manufactures of a country to a greater perfection than by any other means they can attain. Thus, we find that some of the most esteemed and beautiful productions of ornamental art were not designed by men educated for that speciality, but by minds of the highest order stooping from loftier work to endow common things with grace and beauty. The object of a national school of art should, therefore, be like that of a national college, to aim at the loftiest idea, and not at specialities and technical skill. That is the best policy and truest economy for developing the national genius for fine art; the best means for raising an enduring national monument. In conclusion, it now only remains to me to hope that I may have succeeded in convincing the reader of the national importance of encouraging monumental painting.

A HINT.

IT has been remarked, and we think there is truth in the remark, that a style which displays itself only in a certain direction, and which does not permeate the whole range of art, can only be considered a mere fashion. In the matter of costume, a few individuals, or a limited class or community, may adopt a peculiar garb (*e.g.*, the Society of Friends); but they cannot be taken as a criterion of the national taste. So, when a clique of architects adopt a style which has had an exceedingly limited range, the peculiarities of which are only tolerable when produced in one material, and which consists of fragmentary gatherings from past styles patched together so as to produce an effect of quaintness, we necessarily arrive at the conclusion that they start from an insufficient basis.

Originality can only be obtained by a certain amount of freedom, by breaking through the restraints of custom and precedent; but not by assuming the cast-off shackles of a bygone period when a peculiar licence prevailed. When art was really free, there was doubtless a considerable amount of licence indulged in; but it was the licence, the freedom, of the untamed colt in the wilderness, not the freedom of the tamed steed, which we justly consider a vice. The enthusiasm which leads a man to revolt against the cant, formality, and frivolity of fashion, is quite a different thing from the craving for mere novelty, resulting in the substitution of an old cant for a new one. Not to advance is bad enough; but to retrograde is still worse.

Things attained by spasmodic efforts almost invariably disappear as quickly as they have been procured, there is no permanence nor satisfaction in their attainment. It is that which has been acquired by steady sustained endeavour which gives true satisfaction, and produces permanent results. If such is the case in the ordinary commonplace affairs of life, more certainly is it so in the realm of art. A new style, a new era in art, is of second growth, and no spasmodic effort of a coterie will make it otherwise. No permanency can be secured unless under the guidance of true principles; but under such guidance much may be attained by steady perseverance.

All true works of art exhibit certain leading characteristics, and here is one which, at first sight, must strike every thoughtful observer as the chief source of beauty and grandeur, and that is *chiaroscuro*, light and shade. In architecture it is an essential element towards the production of a really good effect, and in every building which has been considered worthy of admiration it will be found that this is the chief source of its beauty. The greater the depth and breadth of the light and shade the grander is the effect. A great mass of light strongly contrasted to a patch of intense shade, produces a remarkable effect, but grandeur is best secured by reversing the process, and making the mass of shade to predominate. Equally distributed patches of light and shade, where there is neither grouping, variety, nor depth, are certain concomitants of a puerile design. Depth of shade should be produced so as to give the greatest effect, to enhance the value of the leading feature of the edifice, a feature which should, as far as possible, speak of and express the purpose for which the building is intended, and to this all other features should be subordinate. It is the effort to make every part of a building equally effective which is the cause of failure in many modern buildings, which produces that restless fussiness which is so antagonistic to the feeling of serenity and repose produced by the contemplation of every great work.

Light and shade can be more effectually produced in an arcuated than in a trabeated style. To span a large opening with a lintel is an expensive matter, and it invariably suggests a feeling of weakness, even when iron is the material employed. But a void may be spanned by means of an arch with any material fit for building purposes, with both the appearance and the reality of strength and stability. The arch may be of any contour to suit the circumstances, but that most generally applicable to all positions and requirements is the round arch.

Now, if those who are attempting to resuscitate the jejune fashions of the time of Queen Anne would concentrate their efforts towards the developing of this feature, were they to resolve to use no other in spanning voids, the effect would soon be discernible in our ordinary street architecture, as well as in more important works. Let them also resolve to eschew projecting key-stones, and all details which tend to destroy the graceful sweep of the semicircle; in short, to copy none of the latter details, but to study those of the Byzantine and Romanesque styles,—styles which never attained the fullest development of which they are capable, and we have no hesitation in saying they they will be in a more likely way towards the attainment of a worthy goal than they are at present.

The Artisans' Dwellings Bill.—This Bill was read a third time in the Commons on the 30th ult., after a brief discussion initiated by Colonel W. Holms, who recommended the Government to improve the measure by making it compulsory, and not leaving it to be put in operation by the medical officer of a district, upon whom such a responsibility ought not to be thrown. It is now going through the Lords.

NEW EMERY STONES.

A NEW kind of polishing-stones is manufactured by Van Baerle & Co., of Worms (Germany), consisting of emery, soluble glass, and petroleum. The emery-stones in general use consist of gum, shellac, and emery. When stones of this description are turned rapidly, either dry or with oil, they get heated to such an extent that the gum or shellac becomes soft, the stone turns greasy, and does not act any longer. The new stones are said to be free from these evils. Their speed may be increased from 1,000 to 2,000 revolutions per minute, according to the size of the stone. When the stones are used for polishing steel, the latter does not get heated to such an extent as with other stones, the steel does not become annealed, and preserves its hardness. The new stones are damped by means of a rag soaked in petroleum. They are made in three shades of fineness,—fine, medium, and coarse.—*Gewerbeblatt für Hessen.*

TIMBER TRADE OF WURTEMBERG.

THE Kingdom of Wurtemburg has a superficial area of 1,950,369 hectares, or 4,819,675 English acres, and, of this area, 596,616 hectares, or 30·6 per cent., are forest lands. Mr. Petre, the British representative at Stuttgardt, states, according to the Society of Arts' *Journal*, that, to prevent waste and deterioration, and to secure the replanting of cleared places, all forests in Wurtemburg are placed under the supervision of the Government forest officials, and the latter exercise their police authority and control with more or less stringency, as circumstances require. In the pinewood district of the Black Forest the wood of the spruce, silver fir, and Scotch fir, from its superior qualities, external and internal, is preferred to all others for building and general purposes. The young trees of weaker growth, derived from the thinnings of the forests, are sold extensively for beansticks, stakes, raft-withes, props for young trees, hop and telegraph poles. The larger trees are chiefly used for building purposes, or for conversion into sawn timber, supplying materials for a very large home industry, and a highly flourishing timber trade. A considerable quantity of the pinewood is made into shingles, boxes, casks, pails, &c. Altogether about 60 per cent. of the pinewood felled is available for timber. The tops and chips are used as fuel, and are largely converted into charcoal, for consumption in the Government foundries. With regard to the hardwood trees, the timber derived from them is applied to more various uses than that from the firs, but as this class of wood, with the exception of oak, is employed chiefly for home consumption, the quantity used as timber is relatively small. The greater part of the hardwoood timber felled is sold for fuel.

The cultivation and preservation of the oak, on account of the demand for it in foreign markets, is an object of special care. The larger stems, especially the crooked ones, are much in demand for shipbuilding purposes, and are exported principally to Holland. They are floated down to the Rhine along with the pine rafts, and from thence to the Dutch shipbuilding yards. Oak timber is also used in considerable quantities for mills, in the construction of waterworks and bridges, and for mining purposes; likewise for railway sleepers, staves, lathwood, &c. The wood of the younger trees, owing to its toughness, is much in request for carriage-building. It is not so suitable, and is less in use for fuel. If the oak mainly supplies timber for general purposes, the beech furnishes the greater portion of the fuel consumed in the country. The ash, maple, elm, and small beech supply useful and valuable wood for carriage-building, joinery, turnery, and for instrument-makers and carvers. The birch, even in its earlier growth, is valuable for making brooms, withes, props for casks and tubs, bars for carriages and carts, &c. It is from 10 per cent. to 15 per. cent. below beech in heating power, but as it burns with more flame, and heats more quickly, it is used in preference as fuel by certain manufacturers,—varnishers, for instance. The alder, the wood of which is chiefly used as fuel, has a similar advantage. Its heating power is about 75 per cent. of that of the beech. Joiners, shoe-cutters, turners, &c., also employ this wood. When grown in water the alder has remarkable durability. The lime-tree yields a soft and light wood, and is much in use as panelwood, in joinery, and for packing-cases, boot-trees, kitchen utensils, and various sorts of carving. The same may be said of the

aspen, the wood of which is sold extensively, at high prices, for paper manufacture and lucifer matches. The heating power of the lime and aspen is about 50 per cent. below that of the beech.

No statistical information exists showing either what proportion of the timber annually cut is exported, or what value it represents. One thing, however, is certain, viz., that the exportations, especially of pinewood, either in its raw state, or in the form of manufactured articles, facilitated as it is by the numerous water-courses and railways, is very considerable indeed.

IMPROVEMENT OF THE WORKMAN.

SIR,—I quite agree with a recent correspondent of yours in what he says of the apathy shown by a great many bricklayers on the subject of education, &c.; but I cannot accept his argument that it is owing to their getting no credit for what they do,—that the foreman, who is generally a carpenter, gets the credit. Surely, they would get the credit if they did anything deserving it. Moreover, have they not the opportunity of honourably competing with the carpenter? Instead of being sulky, would it not be more to their interest, and more pleasant, were they to educate themselves the same as the carpenter, and be his rival in courting the favour and good opinion of the architect? I would say to them, "Make yourselves worthy of his notice, and the architect will not fail to appreciate it when the opportunity presents itself." How is it that there are at this present time (in spite of his assertion that the foreman is generally a carpenter), a number of bricklayers general foremen, and some clerks of works too? Simply because architects are always ready to appreciate ability and good conduct, industry and perseverance, whatever trade may be owner of those qualities. The idea of the specification being placed convenient for perusal by the workmen may not be bad in its way; but when are they to peruse it? Not in their working hours, for that time is the property of their employer, the builder, who takes the contract as a commercial speculation, and he cannot afford it in these days of keen competition; he employs a foreman to study the specification and to carry out its meaning by giving instructions to the workman, whose duty is to do as he is told. But suppose he were allowed time, can he expect to improve himself in the art of his particular branch by studying the specification, which merely describes the character of the work and material, on the supposition that the workman is already possessed of the necessary skill for the proper execution, under the direction of the foreman? If each individual workman is to learn the specification and act upon his own construction of it, we should have in building construction as much confusion as would be experienced in war if every private soldier had a plan of the campaign, and liberty to act according to his individual opinion.

More good might arise from the drawings, plans, and details being hung in a convenient position that any workman so disposed might have an opportunity of seeing them in his meal-times, because it might stimulate him to endeavour to improve his knowledge sufficiently to understand them.

But, I say it with shame, it is not the want of knowledge of plans alone that makes an architect think but little of some bricklayers: it is their lamentable ignorance or utter carelessness of the technical details of their craft, particularly in the bonding of their work, construction of flues, mastery of the plumb-rule and level, regularity of joints, and neatness of finish, &c.; or, to go higher in the branch, what percentage are able to properly strike out, cut, and set in gauge work even an ordinary arch, or how many out of a thousand are able to strike out a three-centre arch filled in to the radius? Surely they do not expect the architect to teach them. They must teach themselves, by personal practical application of the means within the reach of every workman who will take the pains to seek them.

I believe some good would come out of an association of the kind proposed by Mr. Thicke: it would be the means of bringing men who are thirsting after knowledge into contact and communion with those who have drunk more or less of the precious draught, which would inspire them with a feeling of determination to obtain a drink themselves; and, having obtained it, they may then hope some day to be on speaking terms with the architect. Should the association become established I should be only too glad to render my humble services, gratuitously of course, by attending its meetings and assisting to impart instruction to those bricklayers who are anxious and willing to receive it.

A BRICKLAYER CLERK OF WORKS.

CONSTANT AND INTERMITTENT WATER SUPPLY.

INSTITUTION OF CIVIL ENGINEERS.

AT a recent meeting, Mr. Thos. E. Harrison, the president, in the chair, a paper, on "The Systems of Constant and Intermittent Water Supply, and the Prevention of Waste, with special reference to the Restoration of Constant Service in Liverpool," by Mr. G. F. Deacon, C.E., was read.

After explaining the general sources of waste, and the effect of intermittent service on the supply, and entering fully into the objections on sanitary grounds to intermittent service and waste of water, the author described the Parliamentary powers, in reference to pipes and fittings, which until recently had been found necessary, before any corporation or company could give a constant service of water with no greater consumption per head than under the intermittent system. The Acts of Parliament in question had in effect empowered the authorities to prescribe the nature in detail of all fittings and pipes, and the works in connexion therewith, and to interdict the use of any existing fittings and pipes which in their judgment might tend to waste. The Liverpool Corporation had no such powers, and they had never been enabled to order the alteration or removal of any fitting or pipe, however defective, until seen by the inspector to be actually causing waste of water.

The author proceeded to state that ordinary house-to-house inspections had been regularly made from the year 1863 to 1873. In cases of actual waste arising from defects, notices to repair were served upon the persons responsible for the water-rates, and such other steps were taken as the legal powers rendered available. The columns of Table A showed that though the waste-water inspectors had no doubt produced useful results, there was nothing to indicate that, by increasing their number, much further saving would be effected. Indeed, experience was adverse to the possibility of success in the endeavour to reduce the consumption materially even while maintaining intermittent service; and the idea of restoring constant service, with the existing Parliamentary powers, was generally regarded as chimerical.

It was under these circumstances that the Corporation authorised the making of a series of experiments, with a view to discover the locality of a larger proportion of the waste than the house-to-house inspectors were enabled to trace. In carrying out those investigations, the mains supplying fourteen districts in the most densely populated part of the town, containing, in the aggregate, about 31,080 persons, were provided with ordinary piston meters.

The experiments conducted in these districts were then explained in detail. The house service-pipes had been provided with stop-cocks under the footway, and the inspectors, by applying the turning key to the stop-cocks during the night, and placing the ear upon it, were enabled to ascertain in which of the house service-pipes or fittings water was passing to waste. The results were eminently satisfactory; for the consumption of water, which under nine hours' service had been 19·5 gallons, and under constant service 33·5 gallons per head per day, was reduced under constant service to 13·3 gallons, and subsequently to about 12 gallons; while in one district of 2,134 persons it was brought down to 6·6 gallons, without altering a single fitting which had not been found to be actually wasting water.

But in order to obtain such results over the whole district of supply, including a population of 630,000, in a sufficiently short time to ward off the expected dearth of water and to restore constant service, it would have been necessary to inspect several districts every night, and it would have been impossible to ascertain how far the closing of the stop-cocks commanding wasteful property had been faithfully performed, as no record was preserved of the change in the rate of movement of the piston-meter, except that returned by the inspectors themselves. The cost, too, of reliable piston-meters, and of the necessary chambers, was very great, while the expense of maintenance was considerable.

The author then devised an automatic check upon the motions, at once, of the night inspectors and of the water, the cost of which was comparatively small. The instrument, known as the "Waste-water Meter," recorded the two elements of time and rate of flow through the main, after the manner in which an indicator diagram recorded space and pressure. Thus, not only was the change of velocity, induced by the closing of any stopcock during the night, registered, but the time at which the men commenced their work, and the time at which they ceased to work, was recorded with fidelity.

In the establishment of waste-water districts, the existing arrangement of services for distribution was, as far as possible, adopted. The number of meter districts on the 10th of April, 1875, was 120, and the population under control, 306,912. A district having been selected, a sketch was prepared showing the place the meter was to occupy. A length of pipe was removed from the outlet side of the service-valve, and connecting-pipes were laid to beneath the nearest point of the footway, and conveyed the water through the meter. The cast-iron meter cover was placed in the footway next to the kerb. After a meter had been fixed, readings were taken to ascertain the consumption of water in the district under the ordinary intermittent supply. The district was next placed under constant service, and the consumption ascertained under that system, before measures for the prevention of waste were commenced. Stopcocks were attached to the lead-service pipes of all premises, or blocks of premises, which were not already capable of being controlled from the exterior. All new stoptaps were on the screw-down principle, and the loose valve was so arranged that it could not fall out when the stuffing-box was removed. The surface-cover was fixed into the upper side of the flag with Portland cement. The hinged lid was round, and large enough for a man to pass his arm down. Though all new pipes were laid 2 ft. 6 in. deep, they were brought up at the stopcocks to within arm's length, that a washer might be replaced without opening the ground.

The method of night inspection was also described.

It was stated that the experiments in the fourteen districts commanded by piston-meters were commenced in January, 1873; but it was not until October in the same year that the first waste-water meters were fixed. In its earlier stages the system progressed slowly, but recently it had gained in speed. For some time past twelve meters, controlling about 25,300 persons, had been fixed each month; and it was found that, with one chief inspector, twelve ordinary inspectors, six labourers, and one waste-water meter inspector, and two inspectors to attend to special reports in other districts, it was easy to restore constant service to 5,000 persons per week, to sustain it in the old meter districts, and to maintain the average consumption over the whole area supplied at a constantly diminishing rate.

In March, 1874, about 170,996 persons, and in March, 1875, 373,500 persons in the borough were receiving constant supply. During 1873 the maximum number of hours' service to the intermittent districts in the borough was 10½; the minimum, 7½; and the average, 10. Since then the average had been maintained at 10½ hours. In 1873 the out township supply to 91,835 persons was reduced for an average of fourteen weeks to 12 hours per day. Since 1874 constant service had been maintained in the out townships throughout the year. At the beginning of 1874 the total population supplied was about 621,000. At the beginning of 1875 it had increased to about 632,000. During 1873 the amount of water taken for all purposes excepting manufacturers' supplies, measured by meter, was 5,437 million gallons, or 24·42 gallons per head per day. During 1874 the corresponding quantity, measured by meter, was 5,487 million gallons, or 23·8 gallons per head per day. In March, 1874, the rate of supply was about 24·21 gallons per head per day. In March, 1875, it was about 22·26 gallons per head per day.

The number of persons to whose service the waste-water meter system had been applied in Liverpool was 234,000. Taking that moiety of the districts to which attention had been chiefly given, the supply to 117,425 persons, which, under constant service, averaged 32·12 gallons, had been reduced to 15·97 gallons per head per day. If the whole population under treatment was considered, the rate per head per day to 234,000 persons had been reduced from 28·89 gallons to 16·47 gallons, which was equivalent

to a total saving of 1,060,792,200 gallons per annum; and the saving thus far would have been 12·43 gallons per head per day. In Liverpool, the term "domestic consumption" had a much wider signification than in most other towns. It included all supplies for sanitary purposes, and a large proportion for business purposes, excepting only those to the larger manufactories, which were measured by meter. In other towns it was usual to confine the term to the use of water in private dwellings; and this difference would be equivalent, in most cases, to several gallons per head per day.

There could be no doubt that in low-class districts of the metropolis the waste of water was, on the average, much greater than in Liverpool; but if constant service were restored to any single district, that very fact would in a great measure create its own cure. Many of the outlets for water, which, under a few hours' supply, were left continuously open, would, under constant supply, become such intolerable nuisances that the flow must inevitably be checked; and if the owners of property became aware that all cases of waste would be discovered by the night inspectors, and be watched by the authorities until the cause was removed, in the manner which they might prescribe, the district would soon show a lower consumption than under the intermittent system.

WOODEN FLOORS ON ASPHALTE.

A NOVEL method of laying down wooden floors was introduced in France about twenty years ago, and has since then obtained a wide application. It consists in putting down flooring not, as hitherto, on sleepers, but in imbedding the boarding in asphalte. The new floors are used mostly for ground stories of barracks and hospitals, as well as for churches and courts of law. M. Schott, in the *Deutsche Bauzeitung*, draws the attention of architects to this new mode of construction, very little known out of France, and urges that its wider application is desirable on account of its evident usefulness.

For the floors in question, pieces of oak, usually 2½ in. to 4 in. broad, 12 in. to 30 in. long, and 1 in. thick, are pressed down into a layer of hot asphalte not quite ½ in. thick, in the well-known herring-bone pattern. To ensure a complete adhesion of the wood to the asphalte and obtain the smallest possible joints, the edges of the pieces of wood are planed down slanting towards the bottom, so that their cross section becomes wedgelike. Nails, of course, are not necessary, and a perfectly level surface may be given to the flooring by planing after the laying down.

The advantages of this flooring, which only requires an even bed on which it rests, are said to be the following:—

1. Damp from below and its consequence, rot, are prevented.

2. Floors may be cleaned quickly and with the least amount of water, ensuring rapid drying.

3. Vermin cannot accumulate in the joints.

4. Unhealthy exhalations from the soil cannot penetrate into living-rooms. Asphalte being impermeable to damp, rooms become perfectly healthy even if they are not vaulted underneath. In buildings with several stories, as in hospitals, the vitiated air of the lower rooms cannot ascend, an object which it has hitherto not been possible to attain by any other means.

5. The layer of asphalte will also prevent the spreading of fire from one floor to another in case of conflagration.

The flooring here described has been laid in the numerous casemates of the newly constructed forts round Metz, to the satisfaction of the authorities.

The cost is about 1s. per square foot. This estimate, somewhat high, would be much lower in districts where oak and labour are cheaper, and the distance from the places of construction less, and especially where there is more competition amongst contractors than at Metz; and the cost for larger undertakings may be reduced to 8 German mark (8s. English) and under per square metre.

The "Laird Memorial," Birkenhead.—Mr. S. Horner, sculptor, late of Wellingborough, has received instructions from the committee of the "Laird Memorial," Liverpool, to send in a model for a statue to be erected at Birkenhead, to the memory of the deceased M.P. for that borough.

ART AND LITERATURE.*

THE visitor who at the recent dinner in aid of the Artists' Orphan Fund, was called on to respond for "Literature," said,—Many years have passed since I first began to attend the dinners in aid of the Artists' Fund, and it is impossible to look round without remembering genial faces, constant attendants, that will be seen no more. Fortunately, there are others to fill their places, and I venture to say that the fund has never been more efficiently served than it is by the present treasurer, and honorary secretary, Mr. Hardwick and Mr. Millais. I have no pretensions to stand here as a representative of the great stream of literature (the power which moulds the peoples and sways the world), but living all my life on the banks of one of its streamlets, the Literature of Art, that has been deemed a reason why, at a meeting of artists, I should be called on to respond. The ranks of literature have been greatly thinned of late, and many here will grieve with me for the loss of Charles Kingsley and Arthur Helps. While, however, the Roll Call includes such names in the several departments as Carlisle and Gladstone; Herbert Spencer and Huxley; Arnold and Dean Stanley; Tennyson and Browning amongst the poets; and Trollope, Disraeli, and George Elliott, as novelists; the prestige of English literature will be fully maintained, and its power for good increased. The periodical press of England is a marvel and a glory,—its purity not its least remarkable quality; never is seen in it a word to offend the most fastidious; never is there a defender of what is really bad. It is right for artists to recognise their indebtedness to literature, as it is for literary men to acknowledge their obligations to art. Art came before literature; indeed, produced the first form of literature; now art illustrates letters; and literature in turn gives subjects to art. In the present Exhibition of the Royal Academy, for example, Mr. Frith has gone to Smollett; Mr. Dobson to the Book of Books; Mr. Poole to Spenser; Mr. Elmore to Froude; Mr. Ward to the History of Louis XVII.; Mr. Millais to George Meredith; and Mr. Long, for his admirable work, to Herodotus, the father of history. Thus, art and literature are mutually assistant, and ever may they be found hand in hand on the side of right and goodness, elevating and brightening the dull realities of life, and giving to the every-day world the grace of a higher ideal.

THE HOT-WATER APPARATUS AT THE ALEXANDRA PALACE.

THE whole of the heating arrangements here have been planned and carried out by Mr. Wilson W. Phipson, of London, and have been at work since the beginning of the year.

The complete apparatus is on a very extensive scale, having an aggregate heating surface of over 55,400 ft.; it is subdivided into five distinct arrangements, viz.:—No. 1, for Central Hall and Picture Galleries, East and West; No. 2, for the East Covered Court; No. 3, for East Conservatory and Glazed Corridor; No. 4, for West Conservatory and Glazed Corridor, West; and No. 5, for the Concert Hall.

The apparatus, 3, 4, and 5, are worked in the ordinary way by means of hot-water boilers, fixed in the basement of angle-towers, east and west, and are on the Cornish type, 20 ft. long, and 5 ft. in diameter.

The apparatus, 1 and 2, are worked by means of steam heaters placed in the hot-water channels in close proximity to their work, each heater circulating its distinct number of feet of heating surface.

The steam is supplied to them from three multitubular boilers, 16 ft. long and 6 ft. in diameter, fixed in the central portion of the building looking north. These boilers are also used for supplying steam to the engines working the organ.

The pipes in the heating channels are generally 4 in. in diameter; 5 in. wide and 3 in. deep for conservatories; 6 in. wide and 3 in. deep for Central Hall; and are covered over with continuous cast-iron gratings, with bearers under each where they exceed 2 ft. 6 in. width.

The flow and return pipes from boiler are 6 in. in diameter, no larger pipe being used in the whole apparatus.

*"A Reporter" sends the following note of a little speech made at the Artists' Orphan Fund dinner, which occurred too late in the evening to receive any notice in the general account of the proceedings given by the newspapers.

THE ELECTION OF DISTRICT SURVEYORS.

SIR,—Within the memory of the oldest inhabitant (and also of that of the younger ones) of the metropolis, the Board of Works have treated the district surveyors who were elected by the magistrates with great disrespect, for reasons best known to the Board. The old surveyors were, at any rate, gentlemen well known and respected in their position as architects, and might have expected the assistance and confidence of the Board. As the old surveyors died off, or retired, others were elected by the Board who were mostly inexperienced in the duties; while men, and there were several, who had had many years' experience as assistants to the old surveyors, were and are entirely overlooked. If the Board are trying to bring the office into disrepute they are proceeding in the right direction by not appointing the most competent candidates to carry out a very awkward and harassing law. To substantiate what I say, it is only necessary to state that lately one or two of the Board's choice have been dismissed, and that the other day when passing an alteration made to a building under the supervision of a very lately elected officer, I observed no fewer than three points contrary to the Act, and which may hereafter bring trouble and annoyance to those concerned. My object in writing is to suggest that some better mode of election should be instituted rather than to leave it to what may be considered by some as mere patronage. A return even to the old system of election by the magistrates would be more satisfactory. Y.

DRAUGHTSMAN AND CLERK OF WORKS.

SIR,—At the present important period of the history of architecture, and especially of the proposed discussion as to the amalgamation of the two leading societies, will it be out of place to notice the fact that there exists no combination of Assistants—as such—in the profession as there is in almost every other? The Institute of British Architects consists of the highest members, acting as architects, and the Junior Society is avowedly a body of students, led by men of acknowledged reputation; but for the assistant, either as draughtsman or clerk of works, there is no society which certifies him to be what he represents himself, or being such, assists him to dispose of his talents to the best advantage. It may be urged that such a society is not required; that draughtsmen, are, as a rule, architects in *embryo*, and that clerks of works are,—well, not exactly *that*. A little reflection will show, however, that many things are required to make an "architect" in addition to brains, and of the thousands who sign articles, how many must there be obliged to remain as assistants?

And again, why should a clerk of works not be recognised as a professional assistant? Every architect of experience knows how much anxiety he is saved by having a good man under him; but it must be admitted that the opportunity of detecting a mere pretender is not easily provided for. The fact of having been foreman, or leading "hand," should *not* be a sufficient qualification. There is no reason why he should not be a practical man, yet a gentleman, in the same way as a draughtsman should be an artist, yet a practical man. If an association of architectural assistants could be established (not as a union, but for mutual improvement), a considerable amount of good would accrue; and as almost every good, nowadays, comes to us by means of the Press, I venture to trouble you, sir, with what I humbly think is not altogether an unimportant matter. S. E.

ECCLESIASTICAL DECORATIONS.

THE pulpit and screen to the apse of the Congregational Church, Caterham, lately opened, have been decorated from the designs of Mr. John Sulman, architect. The pulpit, constructed of white deal and pine, is of a platform nature, with projecting bay in the centre.

The panels of the latter are laid in with a deep blue ground, with floral studies executed upon the same, in the flat, in lighter hues, and outlined in a deeper tone of the ground-colour. The panels to the faces of the platform on either side of the projecting bay are decorated upon the wood itself in bands of brown, with suitable centre feature to each panel, slightly relieved in gold. The screen in the rear of the pulpit,

which is of wood also, consisting of trefoil-headed vertical panels, with cornice and circular projecting cove above, has the panels of the cove treated in floral studies, executed in the flat, and outlined, upon a gold background. The panels beneath are grounded a deep sage-grey, and have a conventional ornamentation, of a vertical form, executed in gold, in the flat, and outlined, in the centre of each panel. The mouldings to the cornice and the structural part of the screen are the natural wood, stained and partially relieved with deep brown bands and gold.

The work was executed by Messrs. Phillips & Son, of Baker-street, Portman-square.

"TRAITORS' GATE," TOWER OF LONDON.

SIR,—Seeing in your paper of the 1st inst. a statement from a correspondent that the "Old Traitors' Gates" had some years since been sold, and having often in conversation had to contradict some of the most curiously foolish statements imaginable on this same subject, I trust you will pardon me for assuring you that these gates are still in the Tower, and in the Traitors' Dock; that the gates sold some years since, and said to be in Barnum's Museum, were modern deal gates, and that our Yankee friend, if this be true, has for once been fairly "sold." Proof of this I am willing to afford any one sufficiently interested in this matter who will call at my office any day between the hours of 10 a.m. and 4 p.m. JNO. W. PHILLIPS.

R. E. Office, Tower.

STAINED GLASS.

Walworth. — Two more memorial windows have just been fixed in St. John's Church. The figures illustrated are St. Peter and St. James. The latter is erected by members of the congregation to the memory of the Rev. C. E. Hill, a late curate of this church, as a token of their esteem for him. These windows have been supplied by Messrs. Gibbs & Moore.

Chipping Norton (Oxon.).—A stained-glass window has just been completed and fixed in the chancel of the parish church. It consists of five lights and tracery. In the three centre lights is illustrated the Crucifixion, composed of the figure representing our Lord upon the Cross, and Mary Magdalene at the foot of the same, in the centre; and the two Marys and St. John on one side, and St. Peter and two Roman soldiers on the other; beneath these is represented the Angel at the Sepulchre announcing unto the Marys that the Lord is risen. In the two outer lights are the four Evangelists. This window has been erected by Messrs. Gibbs & Moore.

Edinburgh.—A memorial window in mosaic style of stained glass has been erected to the late Dean Ramsay in St. John's Church, Edinburgh, by members of his family. Subjects of Nehemiah rebuilding the walls of Jerusalem, "the Good Shepherd," and the miraculous draught of fishes occupy the three lights of the window. The inscription is:—"To the glory of God and in memory of Edward Bannerman Ramsay, Pastor of this Church 1827 to 1872." The whole is composed of more than 4,000 pieces of glass, each square foot containing about 60 separate pieces. It was executed by Messrs. Ballantine.

Wick.—A stained glass memorial to Major James Horne, of Stirkoke, has been placed in the west window of St. John's Episcopal Church, designed and executed by Messrs. Ballantine & Son, Edinburgh. The window is composed of three main lights, with tracery, and is illustrative of the Nativity. In the centre compartment is Mary with the infant Saviour; beside them is Joseph, and behind is the stable, over which is seen the star of Bethelehem. The side lights contain on the one hand the adoring shepherds laying their humble offerings of a young lamb and doves, while on the other are the Magi bearing their gold, frankincense, and myrrh. Underneath is the inscription:—"In memory of Major James Horne, of Stirkoke, who died there 21st Dec., 1874. Erected by his widow."

Banff.—A memorial to Mr. Alexander Morison, of Bognie and Mountblairy, has been completed by Messrs. Ballantine in the south window of St. Andrew's Episcopal Church. A large venerable figure of St. Andrew, the patron saint, resting upon his cross, occupies the principal portion of the design. The drapery of rich green over a deep-brown skirt is effectively relieved from a grey groundwork diapered with the thistle and St. Andrew's Cross alternately.

Liverpool.—Two large twin-light traceried windows have been placed in St. Paul's Church, Prince's Park. One in the north aisle, illustrative of the Ascension, is inscribed, "In loving memory of Charles Cotesworth. Born August 11th, 1792. Died October 20th, 1857, by his Wife, Mary Ann Cotesworth;" and the other in the south aisle contains figures of our Lord and St. John, and is "to the memory of Kenneth Dowie, born 13th December, 1797. Died 3rd March, 1866. By his affectionate Wife, Mary Dowie." Both windows are by Messrs. Ballantine.

Newcastle.—A memorial window has been erected in the chancel of St. Andrew's Church. It comprises four compartments or bays of considerable height, separated from each other by stone mullions. The window has been executed by Messrs. Wailes. The principal subject is that of Lois and Eunice teaching Timothy the Scriptures. The side-lights have for subjects "Dorcas making and distributing clothing to the poor," and on the panels at the base of each light are Scriptural texts. The upper and lower portions of the window are filled with architectural canopy work, in niches of which are represented statuettes of the four Evangelists and four other Apostles, writers of the Epistles. At the side, on a simple band, is the inscription, "Erected by Archdeacon Waters and Thomas W. Waters, in memory of their Mother and Sister. Anno Domini, 1875."——A three-light decorated Gothic window, in stained glass, has been placed in St. Peter's Church. It was erected by Mr. W. Wailes, to the order of a firm of solicitors, in memory of Mr. Wm. Moneyhill, and is the third of a series of five which will ultimately be erected in that church representing the Twelve Apostles and three other personages of Scriptural fame. The central light represents the figure of St. John the Evangelist, the left represents St. James, and the right St. Jude. The window is about 9 ft. high, and 6 ft. wide.

Ripple.—A memorial stained-glass window has been erected in this church, presented by Mr. Joseph Hall, in memory of his late wife, the subject being the Ascension of our Lord. The window was executed by Mr. George Rogers, of Worcester.

Leicester.—A stained-glass window has been placed in the chancel of St. Peter's Church by the Freemasons belonging to the Leicestershire and Rutland lodges, as a memorial of Earl Howe. Its cost was 130*l*., and it was executed by Messrs. Clayton & Bell, of London. The window contains in the head the emblems of the four Evangelists. The subjects treated are:—The Agony, the Delivery of the Keys to St. Peter, the Denial of Christ, and the Martyrdom of St. Peter. There are several Masonic emblems denoting the various offices held by the late Earl.

CHURCH BUILDING NEWS.

Dawlish.—The parish church has been reopened. The church has been restored, and a new chancel built, at a cost exceeding 6,000*l*. The new pulpit is the gift of Mrs. Rashdale, widow of the late vicar; and the stained-glass windows have been presented by Mrs. Strickland, Miss Hoare, and Mrs. Ware. The architect of the restoration and chancel is Mr. J. P. St. Aubyn, and Messrs. Diment & Stevens, of Bristol, are the contractors.

Dereham.—The repair, or rather reconstruction, by the Ecclesiastical Commissioners, of the chancel of the parish church having involved a like reconstruction of the continuous roof between the chancel and the central or lantern tower, this has been recently completed by the churchwardens. The work has been performed by Mr. Hubbard, builder, of this town, under the superintendence of Mr. Phipson, architect.

Bradford. — On the 8th ult. the Bishop of Ripon laid the foundation-stone of St. Augustine's Church. When fully completed, it will accommodate 1,000 worshippers, but from want of funds, it is intended in the first instance to build only a portion, to accommodate 750 people. Messrs. Healey are the architects.

Welland.—The new church of St. James, Welland, has been consecrated. The corner-stone of the church was laid in July, 1873. The length of the church is 103 ft. There are a nave, tower, south aisle, chancel, with organ-chamber on the south side of the chancel. The style of architecture is Early English. As the edifice is built on a slope from west to east, sufficient room was found for the vestry underneath the chancel. The nave is 24 ft. wide, and the aisle 9 ft. 10 in. The tower is on the south west, and there is only one entrance, which is on the south side of the tower, and which also forms a porch. The tower is a square one, consisting of 30 ft. of masonry, and upon this comes a portion of the oak tower from the old church 34 ft. in height, the whole being surmounted by a spire 51 ft. high, making a total altitude of 115 ft., the vane being 6 ft. higher. The edifice is built in Malvern Hill stone with Bath stone dressings, the columns of the arcade having an admixture of marble. The roof is open timbered, of stained and varnished deal, and the roofing is of green slates from Whitland Abbey. At the east end there is a three-light window, besides a window on the north side of the chancel and one on the south, with credence-tables underneath. On the south side of the nave are four windows. The arcade on the north side is filled in with masonry, with temporary windows between the columns, so that at any future time the edifice can be enlarged by the masonry being taken out, and a north aisle added thereto. The chancel is provided with choir stalls, and in the nave there are 394 sittings. The east window is filled with stained glass by Mr. Hardman. The material for the erection of the church was brought to the spot by the farmers in the neighbourhood, and the cost, including a new peal of bells, will amount to nearly 4,400*l*. The architect was Mr. J. West Hugall, Oxford, and the contractors, were Messrs. Wall & Hook, of Brinscombe, near Stroud.

Earl Stonham (Suffolk).—The parish church has been re-opened after restoration. New roofs have been put on the chancel and on the north and south transepts, in the place of the old ones erected in the seventeenth century, these in their turn having taken the place of the original ones erected in 1450. The chancel roof has been remodelled, and perforated tracery has been added above the hammer-beams. The stalls, which originally numbered eight or ten, had been reduced to two, to make room for the unsightly pews 6 ft. high. These stalls have been restored, and placed parallel with the walls; at the angles are carved the emblems of the Evangelist,—the lion, the ox, the man, and the eagle. The fenestella and sedilia have been restored, the former containing two piscinæ. A small inverted trefoil-shaped light above the chancel window has been filled in with stained glass. The floor of the chancel has been raised three steps, and a new rail of Perpendicular workmanship, with carved spandrels, has been added. Of the nave, the hammer-beam roofing needed nothing to be done, and has formed the model upon which the new roofs in the chancel and transepts have been erected. The stalls have been executed on the same plan as the original ones, of which a few remain. The windows are now glazed with cathedral glass, the mutilated stonework being renewed. There having hitherto been no vestry, the space beneath the tower has been appropriated for that purpose. The church has been paved with encaustic tiles by Messrs. Maw & Co., of Broseley, Staffordshire, several of the old tiles having been discovered. The architects were Messrs. Cory & Ferguson, of Carlisle. The stonework has been carried out by Mr. W. Wells, of Dickleburgh; the carving by Mr. Robert Godbold, of Harleston; and Mr. James Gibbons was the builder. The hot-water system was supplied by Messrs. Page & Girling, of Melton. The cost is about 1,900*l*.

Wakefield. — The foundation-stone of St. Catherine's Church, Bellevue, has been laid. The small school-church at this suburb having been found inadequate, it was resolved to build a new church; the Governors of the Wakefield Charities having made a gift of the site, and the parishioners liberally contributed towards the building fund. The edifice is to stand on a plot of land on the Doncaster-road side, a little nearer to Wakefield than the present school and school-house. It is to be in the Early English style of architecture, built of stone, pitchfaced, with boasted dressings outside, and boasted work inside; roofs open, high-pitched, covered with boards, and slated; stalls and fittings of red deal. Size of church,—nave, 78 ft. by 25 ft.; chancel, 33 ft. by 23 ft.; aisle, 78 ft. by 21 ft.; organ-chamber, 20 ft. by 13 ft.; vestry, 13 ft. by 11 ft.; north porch, 10 ft. by 10 ft. The portion to be erected at present is the nave, chancel, north porch, the arcade dividing the nave and aisle, and a temporary vestry. A temporary wall will be built on the south side of the piers and

arches, to form the south side of the building for the present. A bell-turret will surmount the west gable. The present accommodation will provide for about 350,—for the entire church about 600. The contractor for the mason-work is Mr. Edward Fawcett, and for the wood-work Messrs. Craven & Lloyd, all of Wakefield. The present outlay will be about 2,800*l.* The architect is Mr. Wm. Watson, of Wakefield.

THE AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.

MR. J. D. PRIOR, general secretary of the above-named society, has issued the fifteenth annual report of the executive council, from which we extract the following:—

"We are desirous of offering every possible facility to those who desire to develop their ability as workmen, and in the hope that a stimulus may be given to those who are desirous of self-improvement, our executive council have decided to ask the members by their votes to sanction the establishment of an annual scholarship of one hundred guineas in connexion with the technological examinations instituted by the Society of Arts in conjunction with the Science and Art Department; the scholarship to be awarded to the member of our society most proficient in architectural drawing, building construction, and the practical application of scientific principles to the trade of a carpenter and joiner; subject to conditions to be approved of by the Council of the Society of Arts and the executive council of this society. It has been suggested to the council that the amount could be more advantageously divided into three or more smaller prizes, so as to create a more lively interest and closer competition. Any other suggestion which may be received will be most carefully considered. The council are not desirous of enforcing their own particular suggestion; they desire, with your consent, to devote the amount which has been named in such a way as shall, after mature deliberation, be found best calculated to develop the latent talent possessed by our members, and to increase the attractions of our society by encouraging those who desire to acquire information, and to raise themselves by their own industry and ability.

NON-FULFILMEMT OF CONTRACT.

APPLETON *v.* HARTON.

THE plaintiff in this case, in the York County Court on the 4th inst., was George Appleton, joiner, and the defendant, Henry Harton, joiner. The action was brought to recover 10*l.* 15s. 3d., being 6*l.* 5s. 3d. damages alleged by the plaintiff to have been sustained by him in consequence of a non-fulfilment of contract entered into by the defendant to make, fix, and finish, a glass house,, and 4*l.* 10s. the value of certain wood, and locks, delivered to the defendant. The contract for the building of the glass house was entered into on the 18th of January last, defendant agreeing to do the work for 22*l.*, the money to be paid as the work progressed. Defendant commenced his work, and on a certain date (not named) received 8*l.* 10s. on account. The following Monday or Tuesday he refused to continue his work, and the glass-house being only partly done, plaintiff had to employ some one else to finish it, and had to pay 19*l.* 15s. 3d. Adding to the latter sum the amount paid to the defendant, and deducting from it the amount of contract, produced 6*l.* 5s. 3d., whilst the remainder of the claim was made up in the value of a quantity of "wood feet" and locks, which the plaintiff stated he supplied to the defendant for the purpose of making chests of drawers.

Mr. Watson, for the defendant, objected that the specifications accompanying the agreement or contract were not stamped, and, therefore, not admissible as evidence.

The Judge ruled in Mr. Watson's favour, and, therefore, with respect to the first part of the claim, the plaintiff was nonsuited.

With reference to the second part, Mr. Watson stated that his client had not had a single demand for the work he had in his possession, nor was there any time specified as to when he should have the work completed.

This statement having been corroborated, a verdict was given for the defendant.

BUILDERS' AND ARCHITECTS' ACCOUNTS.

AT Ipswich, Mr. J. Worlledge, judge, heard the case of Alfred Trew, builder, *v.* James Butterworth, architect, which was commenced at the last county court. The action was for 49*l.* 16s. 2d. for builders' work done, and a set-off for 82*l.* 1s. 4d., for surveying and other work was claimed.

His Honour, in delivering judgment, said it was much to be regretted that a settlement was not made before, the accounts extending from 1868. The first item in the plaintiff's bill was 17*l.* 7s. 9d. for work done to defendant's property in Globe-lane. Defendant pleaded that that was a great deal too much, and called builders to support that plea, and as one of them had put the price at 12*l.* 3s. 2d., he should split the difference between the amounts, and allow 14*l.* 15s. 6d. for the work. The next item in plaintiff's bill was 1*l.* 11s. for scaffolding, &c., but as that should be charged to Lord Gwydyr, upon whose property it was used, the item must be struck out. The Judge then came back to the Willoughby Villa transaction. In the specification there was a clause making it necessary that the builder should have a written order for extra work, and as a Dutch oven, &c., came under that head a further reduction of 2*l.* 10s. must be made. Then as to the vaults, for which 15*l.* was charged, it was clear that that was an extra, and, much as he disliked such objections, that item must also come off, making a total reduction of 21*l.* 13s. 2d., leaving a balance of 28*l.* 3s. The Judge then turned his attention to Mr. Butterworth's set-off. Against the first part of that the Statute of Limitations had been pleaded, and the Judge held that the defendant could not claim in a set-off for the sand excavated, which necessitated the vaults being made, and having made large reductions in the other items he allowed 8*l.* 16s. of the set-off, and gave judgment for plaintiff, for 19*l.* 7s.

VARIORUM.

Concordia, a new weekly journal of music and the sister arts, promises the loftiest criticism "possible."——The *South London Chronicle*, speaking of the insufficiency of ordinary sink-traps, says,—

"We have a suggestion to make. We know that a strong current through a funnel may be stopped by a slight pressure over the narrow hole, and, acting upon this knowledge, we suggest that a trial be made of an iron lid fixed to one side of the metal of the sink-trap by a hinge. Such a lid, when shut down, would surely be enough to stop most of the back pressure, and would oppose an effectual barrier to the suction of the atmosphere from within doors."

——The Council of the Society of Medical Officers of Health had the Public Health Bill under their consideration, with the object of suggesting some amendments which are necessary in order to render the Bill fitted to deal with the requirements of the country. According to the *Sanitary Record*, a general feeling was expressed, that, looking at the measure in its present imperfect form, the Bill had so many advantages as a consolidation of existing laws, that it would not be wise to delay its progress through the House during the present session by introducing amendments which involved much discussion. It was considered undesirable to press such amendments, provided the Government could be induced to institute a comprehensive inquiry at an early opportunity. The urgent need for such inquiry and legislation in rural districts was strongly dwelt on, and a hope expressed that the President of the Local Government Board, who has hitherto shown every willingness to consider suggestions which have been placed before him, would adopt this course, which would strengthen the hands of Government, not only by facilitating the passage of the present measure through the House, but also by preparing the way for future legislation.——Laxton's "Builder's Price Book for 1875" maintains its character, and that is saying enough. This is the 58th edition.

Miscellanea.

Queen Anne's Statue.—Mr. Davenport asked the First Commissioner of Works, in the House of Commons on the 3rd instant, whether he was aware of the dilapidated condition of Queen Anne's statue, in Queen Anne's Gate, Westminster, and whether, as the said statue appeared to possess more artistic merit than was usually to be found in our public monuments of this nature, he would consider the propriety of removing it to some position where it would be seen to greater advantage.—Lord H. Lennox: I quite agree with my hon. friend that this statue of Queen Anne possesses more merit than the average of those which adorn our public places. In 1860 it was taken over by a distinguished predecessor of mine, the right hon. gentleman the member for South Hants (Mr. Cowper-Temple), and it has been from time to time repaired by the Office of Works; but I am glad to assure my hon. friend that the condition of the statue generally is not so dilapidated as he appears to think. It is true that at the present time her Majesty is *minus* two fingers, as well as the upper part of the orb. This damage is not due to the effects of our climate, however, but to the great pleasure which street-boys appear to take in pelting this illustrious lady with stones between school-hours. I will see whether this mischief cannot be averted by instructions to the police to watch the statue during the hours when the boys are at play. Considering that the statue is a mural one, and also that its historical associations are with the neighbourhood in which it is placed, I fear I do not see my way to meeting the views of my hon. friend as to the removal of the statue to another site.

Fresh Air.—A few days ago a party of gentlemen attended at St. George's Hospital to witness the working of a new system of ventilation which has been introduced into the Ophthalmic Ward of that institution, by Mr. Martin Tobin, of Leeds, wholly comprised in the fact that a column of air introduced into a room by a vertical current will ascend to the ceiling, and then agreeably to the law of the diffusion of gases spread itself uniformly throughout the enclosed space without producing a perceptible draught in any direction. They visited first the male eye ward, which is not yet ventilated on Mr. Tobin's system, and then the female ward, which is so ventilated, the two being in other respects similar in size and in the number of occupants. The contrast was very striking. Four upright zinc tubes, semi-circular in form about 3 in. diameter, 4 ft. high, and attached to the walls, were found to be delivering rather strong vertical currents, which were traceable by a lighted taper to the top of the apartment, but not an indication of lateral draught was discernible in any part of the ward. A suggestion was made that in order to test the principle more fully, the Bow-street police-court should be ventilated on this plan; and at the instance of the Duke of Westminster a committee was formed, including the Duke of Sutherland, the Duke of Westminster, Dr. Paul, General Scott, General Cotton, and Mr. A. B. Mitford, to investigate and report upon its efficiency generally.

The Surveyor of Works at the Office of Works.—Mr. Dillwyn, in the House of Commons, asked the First Commissioner of Works, whether the Surveyor of Works was or had recently been in the employment of the Metropolitan District Railway Company, and whether the Office of Works had had dealings for land with that company. Lord H. Lennox said the first part of the hon. member's question refers to matters of which I have no official cognisance, and to that he will therefore not expect me to give a reply. With regard to the second part of the question, I can inform the hon. member that in 1868 the Government had dealings with the Metropolitan District Railway in the sale of some land to that company, but the present Surveyor of Works was not engaged in determining or suggesting the price that should be given for that land. Perhaps the hon. member will forgive me for suggesting to him that if he has any charges to bring against the Surveyor of Works (Mr. Hunt), I should be obliged to the hon. member if he would have the goodness to put down on the paper a substantive motion, which would give me, as head of the office, an opportunity of meeting those charges, and of vindicating the character of a public servant.

The Gardens on the Thames Embankment.—On Saturday last without, any formalities, Mr. W. H. Smith, M.P., on the part of the Metropolitan Board of Works, opened another large portion of ground on the northern side of the Embankment, laid out in winding walks, shrubberies, and choice flowers, and dotted over at intervals with resting-places. The garden extends from the Outram Monument, near the Hungerford Viaduct, westward, as far as the boundary line of the private grounds of Whitehall-place fronting the Thames, — in other words, far towards Westminster Bridge; thus making three public gardens, all laid out with taste, between the Temple and the Victoria Tower. The expense of fencing and laying out the latest addition to these ornamental grounds is understood to have been about 3,000*l.*, and the total cost, including the purchase-money, between 6,000*l.* and 7,000*l.* At the ceremony of Saturday, there were present, among others, Colonel Hogg, M.P., Chairman of the Metropolitan Board of Works, and several of its members, Lord Henry Lennox, Sir Charles Russell, and Mr. Solater-Booth, M.P.

Stockwell-green.—The Bill promoted by the Metropolitan Board of Works for the compulsory purchase of Stockwell-green having been rejected by the Committee of the House of Commons, the only hope which the inhabitants have is that the Chancery suit now pending may result in its being declared that the green cannot be built upon.

The "Bessemer" at Calais.—A trial trip was made by the *Bessemer* saloon steamship on Saturday. Unfortunately, as the vessel was entering Calais harbour, she carried away a portion of the pier, for which the local authorities claim 70,000 francs (2,800*l.*).

Memorial of the late Rev. J. Hughes.—On the 3rd inst. there was, in Bunhill Fields Cemetery, an assemblage of ministers and others, friends of the British and Foreign Bible Society, and of the Religious Tract Society, on the occasion of uncovering a monument recently erected to the late Rev. Joseph Hughes, M.A., one of the founders of both those societies, and for many years the secretary of each. He was born in 1769, and died in 1833, and was buried in Bunhill Fields, his name being inscribed at the bottom of an upright stone, which contains the names of several other persons, but the inscription is almost illegible. The monument is close by this grave-stone. Dr. Angus read a statement of the life and career of the deceased; and various other addresses were given. The monument is an obelisk, of grey and red polished granite, and bears two inscriptions, one recording the name of the deceased and the offices he filled, and the date of his death, and on the other are the following words:—"This memorial was raised by friends who venerate his excellence and honour him as one of the founders of societies which have sent the blessed Gospel of Christ to millions abroad and at home."

Demolition of a House Unlawfully Built. A singular case was witnessed at Bagley Fields, Woodhouse-lane, Leeds, on Saturday and Monday last,—the demolition of a house whilst its owner held possession as occupant. It seems that a Mr. Robshaw had built a house in contravention of the provisions of the Leeds Local Improvement Act. He had been repeatedly remonstrated with by the borough officials, and the folly of his conduct pointed out, but he still refused to make any effort to meet the requirements of the law. The question was taken into the law courts, and the decision was adverse to Mr. Robshaw, who, however, ignored it, and on his tenant leaving himself took possession of the house, barricading doors and windows. On Saturday, however, a number of workmen, under the direction of the borough authorities, effected an entrance by removing the tiles, and demolished the house downwards, the tenant retreating from story to story until, on Monday, he was driven into the kitchen, where he held his ground for some time, until persuaded by his friends to give up the contest. The materials of the demolished building are to be sold by public auction, and the costs deducted from the proceeds,—any balance which may be left being payable to Mr. Robshaw.

The Bishop of Lincoln on "Art."—On Sunday last the Bishop of Lincoln brought to a close a series of lecture-sermons which have been in course of delivery at St. James's, Piccadilly, by eminent clergymen on "The Use and Abuse of the World." The bishop's special subject was "Art," and he spoke in enthusiastic terms of painting, architecture, and sculpture. He held to the opinion that a true artist must be a good man, and, on the contrary, if he dealt with sensuality and voluptuousness he degraded himself and demoralised society. He should like to see more facilities given to students for travelling, attending museums, and hearing such lectures as those of Sir Joshua Reynolds, when president of the Royal Academy. He thought no man could carefully inspect such buildings as Westminster Abbey, Lincoln Cathedral, and St. Paul's Cathedral, without being greatly improved. He firmly denounced the hideous and demoralising illustrations which appeared in many of our much-used school-books. All study of art should be connected with religion, for art came down from heaven to earth, and aspired from earth to heaven.

Building Societies.—The Act, which has received the Royal Assent, to repeal section 8 of the statute passed last year on building societies, has been printed. The section was, as now stated, inserted "through inadvertence," and now it is provided that from and after the passing of this Act every society, the rules of which have been certified under the Act 6 & 7 Wm. 4, cap. 32, may obtain a certificate of incorporation under the Act of 1874, and thereupon shall be deemed a society under that Act, and its rules, so far as the same are not contrary to any express provisions of that Act, continue in force until altered or rescinded as in that statute mentioned.

An Architect killed by a Cab.—Mr. T. H. Faulkner, an architect, aged seventy-eight years, of Manchester, was knocked down, the other day, by a cab, and died from the effects of the shock received.

Opening of a Temperance Hall at Norley, Cheshire.—The Norley teetotallers having felt the need of a suitable room in which to hold public and other meetings, a few months ago a suggestion was made that a temperance hall should be erected. Mr. S. Wright, offered, free of cost, a plot of land for the purpose, and the result has been the erection of a hall capable of seating over 300 persons, which was opened on the 27th ult. The building is constructed of plain and ornamental bricks, with Gothic pointed windows and door. Over the entrance is a stone bearing the inscription "Temperance Hall, 1874," and on either side is inserted in the wall a stone with verses inscribed thereon. The interior of the hall is furnished with benches with backs, and there is an elevated platform. The cost of the building was about 400*l*. Mr. James Kirkham, of Runcorn, was the contractor. The excavation was done free of charge by a number of men connected with the movement; nearly all the plastering by Mr. R. Hardman; and the painting by Mr. James Chrimes; the joinery by Messrs. Abraham Faulkner and James Gaskin; and the carting by neighbouring farmers.

A German Church.—The foundation-stone of a new Hamburger Lutheran Church, adjoining the German Hospital, Dalston, has been laid. The church is to supersede the old building formerly in Great Trinity-lane, and will be paid for out of the compensation received from the railway company. The building is in the German Gothic style, cruciform in plan, consisting of a nave without side aisles, and will be covered by an open timber roof in one span. The chancel will have an arched and boarded roof, for the better distribution of sound, while the ancient reredos from the old building will fill the whole space of the end wall. The principal front is to the Alma-road, which leads direct to the German Hospital, with which there will be direct and easy communication for the use of some of the patients. The interior will have accommodation for about 280 worshippers, and the organ from the old building will be erected above the entrance. The cost is estimated at about 10,000*l*.

Tower to the Leicester Municipal Buildings.—At the meeting of the Town Council last week, the Municipal Buildings Committee reported that the architect had, at their request, prepared a design of a proposed amended tower to the municipal buildings, which had been carefully considered by the committee, and an estimate procured from the contractor. The alteration proposed will entail an additional cost of 1,785*l*., but the committee are of opinion that the improvement which it will effect in the appearance of the building will justify the expense, and recommend that Mr. Brass's tender, at the sum above mentioned, be accepted; and the work carried out as shown by the design now submitted to the Council. The report, after some discussion, was adopted.

The Iron and Steel Institute.—The annual general meeting of the Iron and Steel Institute commenced in London on Wednesday last week, Mr. I. Lowthian Bell, presiding. The report stated that this year the autumn meeting would be held in Manchester, in September. The Bessemer medal for 1875 was presented to Dr. Siemens. Mr. W. Menelaus was installed chairman for the ensuing year, and delivered his inaugural address. The conference continued on Thursday, when Mr. I. L. Bell, the ex-president, read a paper of great interest respecting his visit to the mines and ironworks in the United States. Mr. Palmer, M.P., and Mr. Dodds, M.P., were present on the occasion. In the evening, the Institute dinner was held at Willis's Rooms.

Removal of Buildings in Tottenham-court-road.—The Marylebone Vestry, at their meeting on the 6th inst., considered a memorial from the inhabitants of Tottenham-court-road and vicinity, asking the Metropolitan Board of Works, who had forwarded a copy of the memorial to the vestry, to take the present opportunity of removing a block of buildings at the south-west corner of Tottenham-court-road. After some discussion, the memorial was referred to a special committee for consideration and report.

How Art Pays.—The Earl of Dudley has added to his art gallery Turner's picture of the Grand Canal at Venice, it having been resold to him on the day of the auction at an advance of 1,000*l*. If we remember rightly, it was knocked down for 7,000*l*.

Gas-making.—Last week some experiments were made in the gardens of Sutherland House to illustrate an apparatus for producing gas for lighting and heating purposes. Water is supplied to the bottom of a small tubular boiler surrounding a furnace. The steam thus produced is driven, together with a proportion of atmospheric air, through a second fire-box over incandescent coke, and is thus decomposed. The resulting gas is then conducted to the place where it is required for use for heating. When it is wanted far illuminating purposes it is passed first through a carburetter. The water-supply is constant. The fuel employed was charred peat.

The St. Pancras Burial Ground.—The vestry clerk reported last week to the St. Pancras Vestry that the Bill for laying out and using as an open space and place of recreation the burial-ground in St. Pancras-road, had passed the Committee of the House of Lords, with some amendments, and that the grounds were to be kept as an open space for ever, and that the parishioners were to have a perpetual easement over the land. In the event of the Midland Railway Company at any future time being authorised to purchase the land, the vestry were to be reimbursed the amount of their expenditure in laying out the grounds.

Memorial of Dr. Watts.—On the 6th inst. the foundation-stone of a memorial hall to Dr. Isaac Watts, to be erected at the rear of Above Bar, Southampton, was laid by Mr. Samuel Morley, M.P., on a spot abounding with associations of the poet. Dr. Watts was born in French-street, in this town, in 1674, the room in which it is believed he first saw the light being still in existence. The structure will be in free Italian style, and though primarily designed for increased school accommodation, will contain a hall capable of seating 1,000 persons. The whole cost will be about 6,000*l*., of which more than half has been raised.

Music for Leicester-square.—At the meeting of the Metropolitan Board of Works on the 7th inst., the Parks and Open Spaces Committee brought up a report on the application of Mr. Albert Grant, to be allowed to provide a military band to play in Leicester-square-gardens from three to five each Saturday afternoon from May to October, and recommended that it be granted as an experiment for one month, which was adopted by the Board.

Sculpture on the Victoria Embankment. At the meeting of the Metropolitan Board of Works on the 30th ult. the Works Committee submitted a report on the letter from Mr. Charles Lawes, asking the Board to afford him a site on the Victoria Embankment on which to place a model of a group of sculpture, recommending that he be informed that, considering all the circumstances, the Board felt they were unable to comply with his request. On the motion of Mr. Richardson, the report was adopted.

Addenbrooke's Hospital, Cambridge.—At a special meeting of the governors of Addenbrooke's Hospital, Cambridge, on the 3rd inst., a resolution was passed by a small majority affirming the desirability of erecting new buildings for increasing the accommodation of the hospital, at a probable cost of 3,000*l*. A committee is to report at Midsummer upon the best method of providing the required means; meanwhile no actual steps are to be taken with the building itself.

The Cave of Adullam.—Lieutenant Conder, R.E., the officer in charge of the survey of Palestine, reports the recent discovery of the city and cave of Adullam. M. Clermont Ganneau found last year the name of Ayd-el-Mieh attached to a ruin in the "Shephelah," a low country of Judah. The spot has now been visited and thoroughly examined by the survey party, the conclusion arrived at being that it is the veritable site of Adullam. If this be agreed upon, fresh light will be thrown on the principal scenes of David's early life.

Scaffold Accident, Derby.—On the 3rd inst., about five o'clock, a serious accident occurred in Twyford-street, at the back of the Arboretum. A bricklayer named Johnson was at work on a scaffold in front of some new houses in course of erection, and a Midland engine-driver, named Smithard, went on to the planks to speak to him, when the scaffolding gave way and both were precipitated with great violence to the ground, timber and bricks falling upon them. Both were badly hurt.

Remonstrance of Workmen against Middlemen. — The ironworkers throughout England have met, by their delegates, to complain of the system that has sprung up in the trade of masters employing middlemen or sub-contractors, and leaving them to engage the men and pay them their wages. This is regarded as a great grievance, as it relieves the masters from all responsibility over the men, and they are generally in ignorance as to the men's treatment and wages paid.

Local Government Act.—Mr. S. J. Smith, who has been secretary to the Royal Commissioners for inquiring into the pollution of rivers in Great Britain (who have recently completed their labours), has been appointed Assistant Inspector to the Engineering Department of the Local Government Board. Mr. Smith is a civil engineer, and has had considerable practice, we understand, in works of sewering and draining, both as town surveyor and under the War Department at military stations and barracks.

Gas.—At the last meeting of the Metropolitan Board of Works, Mr. Newton, in the course of a lengthened speech, showed from the report of the Gas Light and Coke Company, and from the public transactions of that body, that instead of their not being able to pay the working expenses and what they called a "statutory dividend" of 10 per cent., if their rate were lowered from 5s. 2d. to 5s. they would be able to do all that and leave a surplus of 80,000*l*.

Annan Town-hall Competition. — Seven sets of competing plans were sent in by Scotch and English architects for the proposed new town-hall, police-court, and offices, to be built at Annan, county of Dumfries, and these have been on exhibition for the last fortnight in the old hall. After selection, a plan by a Glasgow architect, whose name has not reached us, was placed first, and one by Mr. Stephen Shaw, of Kendal, placed second in order of merit.

A New Public Garden in Bethnal-green.—At the meeting of the Bethnal-green Board of Guardians, on the 4th inst., the chairman stated that the space of ground between the East London Museum and St. John's Church, Bethnal-green, which has recently been laid out as a garden and recreation-ground for the public, would be formally opened on the 19th inst., by Lord Henry Lennox, First Commissioner of Works.

Free Library and Art Gallery for Southport.—Southport is to have a free library and fine art gallery, Mr. W. Atkinson having offered the sum of 6,000*l*. for the erection of the building. That the young borough is making progress is proved by two facts reported to a recent meeting of the Town Council. One was that there had been over 600 houses built during the past year, and the other that increased lock-up accommodation had become necessary.

Hinckley.—A vestry meeting has been held at the parish church, to take into consideration the enlargement and restoration of the church, the removal of the galleries and pews and stalls, and the re-pewing or re-seating of the same, &c. Mr. Foxwell proposed a resolution which combined in it all the alterations contemplated in the church. The motion was seconded by Mr. Clarke and carried.

Insecure Scaffolding.—An accident, which might have been of a serious character, happened at Buttershaw, near Shelf. Owing to the slipping of an iron support, the scaffolding of a house now building for Mr. S. Barraclough gave way, and two men named John Sharp, mason, and Thomas Gibson, labourer, were precipitated to the ground, followed by a barrowful of stones.

North Stanley Church, Ripon.—Certain alterations embracing the entire re-seating, new pulpit, &c., are about to be made in the Church of St. Mary, North Stanley. The cost will be defrayed by Mrs. Staveley, of Old Gleningford Hall. The church, which was erected in 1842, is remarkable for the quantity of its stained glass. The alterations will be carried out from the designs of Mr. G. G. Hoskins, architect, Darlington.

Leaving Work without Notice.—Twelve puddlers, in the employment of the Albion Steel and Wire Company, were, on the 10th inst., each fined 3*l*. and costs by the Sheffield stipendiary magistrate, for leaving their work, on April 29th, without proper notice. The company claimed 60*l*. as compensation, but it was not allowed.

St. George's Church, Barnsley.—On the 3rd inst. the corner-stone of a new chancel about to be added to St. George's Church was laid in the presence of a goodly company. The cost of the alterations is estimated at 2,000*l*., and up to the present time 1,450*l*. have been subscribed. Messrs. Healey Brothers, of Bradford, are the architects, and Messrs. Robinson & Sons, Barnsley the contractors.

Science and Art Classes.—An examination in building construction took place at the Mechanics' Institute, Slough, on Saturday last, when three candidates presented themselves. There were present to superintend it, Major Courtney (Government Inspector), Mr. J. Rowland Williams, and Mr. E. Brown (hon. secretary).

Art-Union of London.—The county of Kent, according to Kent papers, has been more fortunate than any other county in England in the number of prizeholders this year, and they give a list of thirty-four names. Cheltenham has also been very successful, no less than ten principal prizes falling to that town.

Greenham New Church.—The contract for the erection of this church has been taken by Mr. Samuel Elliott, of West-street, and it is expected that the work will commence in about a fortnight. Mr. Woodyear, of Grafham, Guildford, is the architect.

West Ardsley School Board.—The competition for new schools in this district has been decided in favour of those submitted by Messrs. Holtom & Connon, of Dewsbury; fourteen sets of designs were submitted to the Board.

Cause and Effect. — Because two little children who were left to play by themselves in a barn in Poignant, Savoy, happened to have two or three lucifer matches in their possession, the whole village was destroyed and fifty-two people were rendered homeless.

"Eve at the Fountain." — The South Kensington Museum has just received as a gift the well-known marble statue "Eve at the Fountain," by E. H. Baily, R.A.

River Pollution.—On Wednesday evening last a paper "On River Pollution and the Impurities of the Water supplied to our Towns," by Mr. Jabez Hogg, was read at the Society of Arts.

Society for the Encouragement of the Fine Arts. — The next *conversazione* will be held on Thursday, 20th, in the Suffolk-street Galleries.

Norwich Cathedral.—The Dean and Chapter of Norwich Cathedral are about to expend between 2,000*l*. and 3,000*l*. in the restoration of the west front of that cathedral.

TENDERS

For additions and alterations to the residence of Mr. H. Clark, Sydenham-hill. Mr. Thomas Porter, architect. Quantities by Mr. C. F. Selby:—

Peto, Brothers	£3,332 0 0
Nixon & Son	3,255 0 0
Holland & Hannen	3,225 0 0
Browne & Robinson	3,186 0 0
Patrick & Son (accepted)	3,110 0 0

For enlarging the Imperial Wharf, Wharfdale-road, King's-cross. Messrs. Lander & Bedells, architects:—

Webber	£647 0 0
Moreland & Nixon	640 0 0
Ward	639 0 0
Grover	637 0 0
Williams & Son	637 0 0

(Close estimating.)

For alterations, &c., to Lower Clapton Congregational church and schools. Messrs. Chas. G. Searle & Sons, architects. Quantities supplied by Mr. C. H. Searle:—

Perry & Co.	£3,545 0 0
Brass	3,445 0 0
Newman & Mann	3,336 0 0
Browne & Robinson	3,323 0 0
Dove, Brothers	3,275 0 0
Sewell & Son	3,231 0 0
Chessum (accepted)	2,975 0 0

For erecting houses and shops on plots A and B, Holborn Viaduct, for the Holborn Viaduct Land Company, Limited. Mr. E. N. Clifton, architect:—

Plot A.

Ashby & Horner	£23,950 0 0
Conder	23,417 0 0
Smith & Co.	23,200 0 0
Ashby, Brothers	22,920 0 0
Patrick	22,753 0 0
Holland & Hannen	22,527 0 0
Peto, Brothers	22,166 0 0
Brass	21,298 0 0

Plot B.

Ashby, Brothers	31,132 0 0
Smith & Co.	30,660 0 0
Patrick	30,464 0 0
Ashby & Horner	29,870 0 0
Holland & Hannen	29,393 0 0
Conder	29,319 0 0
Peto, Brothers	29,288 0 0
Brass	27,630 0 0

For finishing houses and shops, Holborn Viaduct, for the Holborn Viaduct Land Company, Limited. Mr. E. N. Clifton, architect:—

Ashby & Horner	£17,992 0 0
Jackson & Shaw	17,846 0 0
Holland & Hannen	17,810 0 0
Macey	17,776 0 0
Brass	17,735 0 0
Peto, Brothers	17,687 0 0
Conder	17,599 0 0

For erecting houses and shops on plot E, Holborn Viaduct, for the Holborn Viaduct Land Company, Limited. Mr. E. N. Clifton, architect:—

Patrick	£27,800 0 0
Holland & Hannen	27,435 0 0
Conder	26,649 0 0
Brass	26,402 0 0
Macey	25,870 0 0
Peto, Brothers	25,832 0 0

For works in Vauxhall Bridge-road and Carlisle-place, Westminster, for Mr. Carlo Brunetti. Mr. A. Bridgman, architect:—

Crossley	£36,970 0 0
Brass	35,683 0 0
Cooke & Green	35,495 0 0
Perry	34,494 0 0
Macey	34,400 0 0
Niblett	34,000 0 0
Peto, Brothers	33,736 0 0
Bracher & Sons	28,975 0 0

For fittings National Safe Deposit Company's premises, Queen Victoria-street. Mr. J. Whichcord, architect:—

	Mahogany.	Wainscot.
Sage	£4,170	£4,443
Sommerville & Smith	3,866	4,059
Drew	2,706	2,987
Peto, Brothers	2,764	2,911

For additions and alterations to house, Sydenham-hill for Mr. Edward Clarke. Mr. T. Porter, architect:—

Peto, Brothers	£3,332 0 0
Nixon & Sons	3,255 0 0
Holland & Hannen	3,225 0 0
Browne & Robinson	3,186 0 0
Patrick	3,110 0 0

For alterations and repairs to warehouse, No. 15, Great Garden-street, for Messrs. A. Allan & Son. Mr. H. Ough, architect:—

		Extra for asphalte floor.
Palmer	£208 0 0	£30 0 0
Martin	205 0 0	20 0 0

For erecting new farm buildings at Compton Field-place, near Godalming, Surrey, for Mr. John King. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Nye	£1,484 0 0
Goddard & Sons	1,301 0 0
Pink	1,274 0 0
Moon	1,259 0 0
Mitchell	1,225 0 0

Additions to chemical works, Millwall, London, for Messrs. David Stour & Sons. Messrs. J. Hamilton & J. Fogerty, architects:—

Foster	£2,790 0 0
Ennor (accepted)	2,669 13 0

For St. Stephen's Church, Ealing. Mr. John Ashdown architect. Quantities supplied by Mr. J. S. Lee:—

McLachlan & Son	£6,180 0 0
Jackson & Shaw	6,005 0 0
Dove, Brothers	5,975 0 0
Adamson	5,719 0 0
Nye (accepted)	5,274 0 0

For factory at Kettering, Northants. Mr. R. W. Johnson, architect:—

Margetts & Manby	£2,661 0 0
Bellamy	2,538 0 0
Henson	2,422 0 0
Shurmur	2,389 0 0
Barlow	2,320 0 0
Ironwork.	
Mather	£204 0 0
Wright	194 4 0
Mobbs	192 0 0
Salmon	183 16 0
Richards & Co.	181 10 0

For the erection of the Grand Hotel, Eastbourne, for Mr. William Earp. Mr. R. K. Blessley, architect:—

Cheesman & Co.	£26,200 0 0
Chappell & Co.	23,874 0 0
Stenning & Co.	23,242 0 0
Bruton & Co.	22,789 0 0
Howell & Son	21,674 0 0
Peerless	20,555 0 0

For Congregational Church at Hatfield Heath, Essex. Mr. T. Lewis Banks, architect. Quantities supplied by Mr. A. J. Gate:—

	With Bath stone dressings.	With brick dressings.	Allow for old materials.
Glasscock	£3,395	£3,354	£40
Burton	3,350	3,300	30
Toms	3,272	3,222	20
Cornwell*	3,000	2,955	45
Gibbons	2,997	2,963	20

* Accepted for Bath stone dressings.

For the erection of a shed at Tipton, for Mr. Edmund Hodgkinson. Messrs. Round & Beddoe, architects:—

Stockton & Son	£159 0 0
Nicklin	140 0 0
Adams	135 0 0
Grosvenor	130 0 0
Tranter (accepted)	115 17 0
Ditto (extra width)	36 0 0

For road-making and drainage works, for the British Land Company, Limited, on their estate at West Ham, Essex:—

Dunmore	£3,361 0 0
Thompson & Son	2,944 0 0
Johnson	2,900 0 0
Keeble	2,691 0 0
Harris	2,460 0 0
Clarke	2,400 0 0
Bloomfield	2,380 0 0
Pizzey	2,235 10 0
Jackson	2,225 0 0
Marney	2,156 14 0
Richardson (accepted)	2,125 0 0

For the erection of a warehouse at London Fields, Hackney. Mr. E. C. Homer, architect:—

High	£1,187 0 0
Kirk & Randall	1,165 0 0
Jarvis & Sons	1,156 0 0
Watts	1,154 0 0
Tibbitt	1,112 0 0
Williamson	1,095 0 0
Bangs & Co. (accepted)	1,090 0 0

For enlargement of the chancel of St. Paul's Church, Carlisle, for the Rev. F. Richardson. Messrs. E. Habershon & Brock, architects:—

Armstrong (accepted)	£430 0 0

For new church at Rowfant, Sussex, for Lady Lampson. Messrs. E. Habershon & Brock, architects. Quantities supplied:—

Howe & White	£3,370 16 0
Newman & Mann	3,100 0 0
Rowland	2,884 0 0
Steer	2,755 0 0
Shearburn	2,742 0 0

For the new vagrants' wards at the Hackney Union Workhouse. Messrs. Lee & Smith, architects. Quantities supplied by Messrs. Linsdell & Giffard:—

Bangs	£4,449 0 0
High	4,268 0 0
Thompson	4,246 0 0
Waldram	4,197 0 0
Shurmur	4,140 0 0
Smith	4,103 0 0
Forrest	3,787 0 0

For additions to Messrs. J. Lovibond & Son's Brewery, at Greenwich. Mr. J. Kiddle, architect:—

Newman & Mann (accepted)	£3,220 0 0

For alterations to premises, Hoxton, for the Tower Hamlets Rifle Brigade. Mr. B. Fletcher, architect:—

Newman & Mann	£750 0 0
Curtis	692 0 0
Palmer	645 0 0
Eunor	638 0 0
Brevitter	547 0 0

For alterations at Charlton House, Charlton, Surrey. Mr. G. Cuthbert, architect. Quantities not supplied:—

	House.	Bay window.
Newman & Mann	£765	£56
Faulkner	746	50

For taking down and rebuilding the premises, Nos. 92 and 93, Leadenhall-street, for Mr. W. Connolly. Mr. E. P. Notley, architect. Quantities supplied by Messrs. Linsdill & Giffard:—

McLachlan	£2,867 0 0
Oliver	2,439 0 0
Rudkin	2,438 0 0
Faulkner	2,375 0 0
Greenwood & Sons	2,349 0 0
Hart	2,344 0 0
Kelly	2,332 0 0
Scrivener & White	2,262 0 0
Killby	2,237 0 0
Newman & Mann	2,220 0 0
Browne & Robinson	2,160 0 0

For works, No. 88, Borough, for Messrs. C. Woollotton & Co. Mr. E. J. I'Anson, architect. Quantities not supplied:—

Newman & Mann	£680 0 0
Rider & Son	618 0 0

For new schools and offices at Thomas-street, Limehouse, for the School Board for London. Mr. E. R. Robson, architect. Quantities supplied by Mr. W. H. Barber:—

Thompson	£8,780 0 0
Newman & Mann	8,665 0 0
Wood	8,547 0 0
Killby	8,440 0 0
Hill, Higgs, & Hill	8,424 0 0
Atherton & Latta	8,375 0 0
Sheffield	7,847 0 0

For offices at Railway-place, Fenchurch-street. Mr. Albert Bridgman, architect. Quantities supplied by Mr. James Barnett:—

Lacey	£9,400 0 0
Newman & Mann	8,630 0 0
Killby	8,583 0 0
Crossley	8,395 0 0
Cooke & Green	8,167 0 0
Niblett & Son	8,100 0 0
Sharpington & Cole	7,997 0 0
High	7,982 0 0
Scrivener & White	7,882 0 0
Carter	7,840 0 0
Tongue	7,700 0 0
Elkington	6,749 0 0
Bracher & Son	6,590 0 0

For additions and sub-basement at Gordon House, Highgate. Messrs. Tress & Innes, architects. Quantities not supplied:—

Newman & Mann	£626 0 0
Sewell & Sons	394 0 0

For alterations and additions to shop, 26, Hampstead-road, for Mr. J. Rickards. Mr. W. Croucher, architect:—

Blandford & Co.	£135 0 0
Langsford (accepted)	110 0 0

For warehouse at Bromley, Middlesex. Mr. Herbert Winstanley, architect. Quantities supplied:—

Thomas	£7,451 0 0
Webster	7,265 0 0
Thompson	7,174 0 0
Perry & Co.	7,007 0 0
Patman & Fotheringham	6,485 0 0
Hill, Higgs, & Hill	6,430 0 0
Bangs & Co. (accepted)	6,145 0 0

For school, Mantua-street, Lambeth, for the London School Board. Mr. E. R. Robson, architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

Tyerman	£12,495 11 0
Williams & Son	12,330 0 0
Eunor	12,248 0 0
Cooper	11,945 0 0
Kirk & Randall	11,854 0 0
Wall, Brothers	11,841 0 0
Hobson	11,817 0 0
Sheffield	11,803 0 0
Nightingale	11,793 0 0
Hill, Higgs, & Hill	11,784 0 0

For alterations and additions, Mill Lodge, Barnes, for Mr. S. W. Keene. Mr. Edgar Leuchars, architect. Quantities supplied:—

		Additional for fittings.
Nixon & Son	£1,686	£59 0 0
Allen	1,586	51 12 6
Macey	1,520	51 0 0
Adamson	1,483	54 0 0
Hobson	1,436	52 0 0

For erecting eight houses and shops, Camden-town, allowing for old materials. Mr. H. H. Bridgman, architect. Quantities by Mr. Walter Barnett:—

	With basement.	Without basement.
Crockett	£6,125	5,945
Willson, Brothers	6,074	5,104
Manley & Rogers	5,900	5,310
Elkington	5,820	5,359
Scrivener & White	5,681	5,219
Kelly, Brothers	5,440	4,983
Aitchison & Walker	5,430	4,990
Bracher & Son	5,262	4,938

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